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- Validate the science of respiratory care and the value of the respiratory therapist (RT) in providing respiratory care by supporting, conducting, and publishing research information.
- Promote respiratory therapists as the best providers of respiratory care by assuring that the science that clarifies the value and role of the RT is provided to those stakeholders whose decisions and actions need to be guided by that information.
- Promote respiratory therapists and the American Association for Respiratory Care by developing and implementing promotion and marketing campaigns targeted to unique audiences.
- Assure the Association has the resources to meet the needs of its members and that the AARC has the needed financial, volunteer, and staff resources needed to accomplish the implementation of the strategic plan of the Association.

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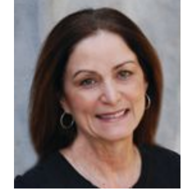

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Do Unconventional Sleep Therapies Work?

by Sheri Tooley, BSRT, RRT-NPS, CPFT

It is well established that positive airway pressure (PAP) therapy remains the gold standard for the treatment of obstructive sleep apnea syndrome (OSAS). Despite this fact, data suggests long-term compliance rates of <70%.[1] Literature cites bulky gear and an unappealing appearance to bed partners as the primary reasons for discontinuance, not comfort. However, this data is dated; and with many new interfaces introduced every day, we would expect compliance to improve.

Goals for the treatment of OSAS are to prevent obstructive apneas and hypopneas, improve symptoms, and modify cardiovascular risks. Severity of disease is classified by the apnea-hypopnea index (AHI) as shown in Table 1.

The health and economic burden of OSAS has been well documented, with the greatest prevalence burden seen in the mild OSAS group. It is particularly difficult to convince this group that the benefits of PAP therapy outweigh the obtrusive nature of the treatment. Other non-surgical and surgical treatments of OSAS are available, but efficacy runs the gamut.

Mandibular advancement devices

A review of non-surgical treatments for OSAS reveals that mandibular advancement devices (MAD) are the most common class of oral appliances (OAs) used. These devices manually protrude the mandible to improve the patency of the upper airway. MAD designs vary widely in clinical use and in research. But generally, there are two types of MADs. They either have a one-piece (monobloc) or two-piece (duobloc) configuration.[2] Design features vary in terms of construction material, size, coupling mechanism, and the degree of customization to the individual's dentition. These variations may result in varied outcomes in efficacy, adverse effects, and compliance. Overall, customized devices appear to stay in place better, be more comfortable, and have a higher rate of efficacy.

According to the literature, approximately 65% of MAD patients achieve a 50% reduction in AHI, and 40% achieve a complete response to fewer than five events per hour.[2] MAD treatment also improves SaO_2, but rarely to normal levels. Excessive daytime sleepiness and quality of life is subjectively improved with MAD, as well. Two studies also showed a modest 2–4 mm Hg reduction in blood pressure after three months of treatment with MAD.

Adverse effects have been reported with the use of OAs and include:[3]

- Temporo-mandibular joint pain
- Teeth or facial musculature pain
- Bite change
- Excessive salivation
- Dry mouth.

Pooled compliance data for MAD after one year was 77%. The American Academy of Sleep Medicine revised its clinical practice guidelines to include treatment of OSAS with oral appliances. They state that oral appliances are indicated for the treatment of mild-to-moderate OSAS in patients who are unable or unwilling to tolerate PAP therapy.

Positional therapy

Positional OSAS is defined as a supine AHI that is at least twice that in the lateral position.[2] The prevalence is approximately 50%. A number of small studies have examined the effectiveness of specialty cervical pillows and

about the author...

Sheri Tooley, BSRT, RRT-NPS, CPFT, is the respiratory care education supervisor at Rochester General Hospital in Rochester, NY.

the "tennis ball technique" (basically, a tennis ball placed in the back of the shirt worn while sleeping) to treat this form of OSAS. Both of these were designed to keep patients off their backs and reduce the effects of gravity and neck position. The specialty cervical pillow effectively reduced the AHI to less than five events per hour and improved SaO_2. Long-term compliance in one study was 38% after six months and only 10% after 30 months in another.[4]

Oropharyngeal exercises

A small randomized clinical trial enrolled 31 participants to evaluate the effect of oropharyngeal exercises on moderate OSAS. The regimen was carried out on a daily basis over a three-month period and consisted of 30 minutes of exercises involving the tongue, soft palate, and lateral pharyngeal wall. Patients in the exercise group (n=16) improved in objective measurements of OSAS severity and subjective measurements of snoring, daytime sleepiness, and sleep quality.[5]

Surgical interventions

Surgical interventions aimed at curing OSAS have not yielded positive outcomes, with the exception of tracheotomy. Tracheotomy was the first effective treatment for OSAS, but today PAP therapy is considered an effective and acceptable alternative to tracheotomy. The following procedures are of major surgical interest in treating and curing OSAS:

Palatal surgery: Several studies have explored the role of laser-assisted uvuloplasty (LAUP) in the treatment of OSAS. There were no differences in the AHI or the Epworth Sleepiness Scale between the surgical and placebo groups at three months. Results from 19 studies on uvulopalatopharyngoplasty (UPPP) reported a 38.2% fall in AHI from a baseline of 60. The American Academy of Sleep Medicine does not recommend LAUP or UPPP for the treatment of sleep-related breathing disorders.[1]

Maxillofacial surgery: Stanford University proposed a step-wise approach to OSAS in 1999. Phase I surgery was a UPPP and genioglossus advancement with hyoid myotomy suspension. If patients were not responsive to Phase I, they proceeded to Phase II, which included a maxillary-mandibular advancement osteotomy. Among the 306 patients who were treated, researchers noted a fall in AHI from 55.8 to 9.2 postoperatively. However, many shortcomings were identified in the research, including lack of a control group, potential for selection bias, and incomplete followup. Surgical expertise for this procedure is only available in a few centers. Randomized controlled studies are needed to validate the treatment.[1]

> It is difficult to convince OSAS patients that the benefits of PAP therapy outweigh the obtrusive nature of the treatment.

Table 1. Disease Severity Classifications

Mild:	5–15 apnea/hypopnea events/hour
Moderate:	16–29 apnea/hypopnea events/hour
Severe:	≥ 30 apnea/hypopnea events/hour

Radiofrequency (RF) tissue volume reduction: This procedure was proposed in 1997 and involves radiofrequency tissue volume reduction of the tongue. RF energy is delivered to the tongue by a needle electrode that causes a localized thermal lesion resulting in scarring and a 26% reduction at the treatment site. Observational studies have only shown a partial response in AHI. RF does not appear to be an effective treatment for OSAS at this time.

Hypoglossal nerve stimulation: Electrical stimulation of the dilator muscles during sleep results in reduced upper airway collapsibility and reduces airflow limitation. In one study, AHI was reduced from 52 to 22 events per hour. This therapy remains experimental but has potential as a therapeutic option for OSAS.

Several other therapies reviewed have yielded little scientific data to support their use. These included:

- Acupuncture
- Herbal therapy
- Several drug classes, including steroids and methylxanthines.

Weighing the alternatives

The future of OSAS management must address poor patient acceptance of the current gold standard treatment of PAP. There is undoubtedly a need for alternative treatment modalities to positive airway pressure. While PAP therapy appears to remain superior to the oral

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Ambulation of the Ventilator Patient in the ICU: Does It Make a Difference?

by Keith D. Lamb, RRT

"The longest journey begins with a single step."
– Lao Tsu, "Tao Te Ching"

Today's ICU patients are difficult to ambulate because they are often attached to large pieces of equipment and have indwelling lines that can easily become dislodged. As if these obstacles were not enough, ICU patients are very often on high levels of sedative and analgesic agents, keeping them in a near comatose state.

Multi-system organ failure and dysfunction require intensive therapies and focus. This same focus is often not applied to prevention of the muscle degeneration and deconditioning that is inevitable during a lengthy ICU stay. The adverse sequelae of acute and prolonged bed rest are well described. They are a fundamental consequence of our ever-evolving ability to keep patients alive for longer periods of time and help them survive more serious illness and injury, which eventually requires complex discharge planning. It has been suggested that rehabilitation should be started as soon as physically possible in an attempt to prevent these sequelae and that tracheal intubation should not be a contraindication in and of itself.

about the author…

Keith D. Lamb, RRT, is an RT II in surgical critical care at Christiana Care Health System in Newark, DE, and chair of the AARC Adult Acute Care Section.

History

In the 1960s it was not unusual to pass an ICU that was full of awake and oriented patients. Often these patients were intubated, sitting in chairs, and participating in their own care. The autonomy of these patients was a priority, and early ambulation and exercise were encouraged. It was understood that prolonged bed rest had consequences and that the earlier a patient was up and moving, the sooner he would recover.[1]

In the 1970s, several institutions published reports describing the ambulation of intubated and ventilated patients. One such early report was submitted by the University of Colorado.[1,2] In this report, early ambulation of the intubated ICU patient was credited with an "improved sense of well-being and the increased general strength of the patient."

As the years have passed, our ability to keep people alive for longer periods of time has increased markedly. Parallel with these improvements is the increased need for sedation in order to institute high-end therapies that may impose discomfort. Today, most modern ICUs are filled with heavily sedated patients who often remain that way for weeks on end, receiving complex supportive therapies such as mechanical ventilation, hemodialysis, and others.

In a recent attempt to prove a turn in the tide, Thomsen et al investigated a theory that intubated patients who were quickly transferred to a unit that specifically targeted early physical activity would, in fact, ambulate early.[3] Thomsen's group studied 104 respiratory failure patients who required mechanical ventilation for more than four days. Transferring a patient to the respiratory ICU (the unit that made early physical activity a priority) substantially increased the probability of ambulation. After two days in the unit, the number of patients ambulating had increased three-fold compared with pre-transfer rates.

A 2009 review of recent literature by Kress illustrates the important role that the level of consciousness plays in the patient's ability to ambulate and begin early out-of-bed activity.[4] Careful administration of sedatives and analgesia are paramount to preserve neurological function and begin early rehabilitation and physical therapy.

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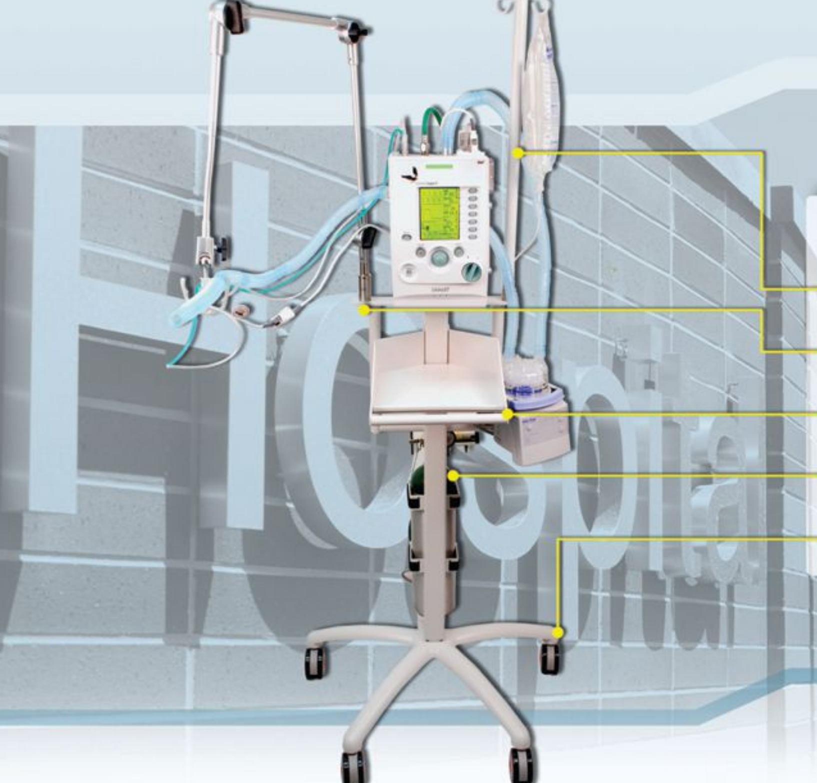

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Sequelae of prolonged bed rest

As previously stated, the detrimental effects of prolonged bed rest are well studied and may be more complex than once believed. Micro-physiologic changes in muscle fiber, such as atrophy, occur very early; metabolism changes can produce microvascular dysfunction and insulin resistance in less than a week. It is also believed that normal muscle activity is responsible for anti-inflammatory responses. These responses are particularly helpful in diseases such as sepsis and acute respiratory distress syndrome, where complex inflammatory proc-esses are involved.[5]

The detrimental effects of prolonged bed rest may be more complex than once believed. Micro-physiologic changes in muscle fiber occur very early, and metabolism changes can produce microvascular dysfunction and insulin resistance in less than a week.

Bed rest and inactivity contribute to other systemic dysfunction as well. Human research on this topic consists primarily of studies done on healthy adults who were evaluated during their association with various space programs.[1] Problems identified in these studies include a worsening in cardiodynamic parameters such as a decrease in volume and cardiac output. Resultant orthostatic hypotension is not uncommon.[5,6]

Case report

A case study on the use of early ambulation in the ICU was presented by Dale M. Needham, MD, PhD, an associate professor with the division of pulmonary and critical care medicine and department of physical medicine and rehabilitation at Johns Hopkins University in Baltimore, MD, and published in JAMA.[1] The presentation focused on a 56-year-old male with severe COPD who was intubated for acute respiratory failure. The patient spent two months in the ICU surviving a complicated course of aspiration and sepsis. His ICU discharge was followed by six weeks of intense rehabilitation.

The author conducted a short interview with Dr. Dale Needham on his thoughts regarding this case study:

Author: *Good morning Dr. Needham, and thank you for agreeing to discuss this very important topic and case study. You took care of a gentleman who experienced a severe exacerbation of COPD and a complicated hospital course during which he was intubated for quite some time. After you extubated this patient you discussed his feelings regarding prolonged bed rest. What did he have to say?*

Dr. Needham: *He said that being in bed all day was unbearable. He mentioned that having nurses do everything for you the whole time made him feel like he was losing his dignity.*

Author: *How did your patient react to the idea of getting up and walking with an endotracheal tube sticking out of his mouth?*

Dr. Needham: *He was clearly very excited and enthusiastic. Getting off his back and being able to walk around had a very positive impact on him.*

Author: *How do you think your decision to have your team ambulate this patient while he was intubated impacted his quality of life after discharge?*

Dr. Needham: *I believe that his ability to easily negotiate daily life, including bathing himself, cooking his own meals, and spending time outdoors, can be directly attributed to us avoiding long periods of bed rest and associated complications.*

Author: *Your management strategy clearly worked well with this specific patient. Have you had similar experiences with other patients, and if so, what advice can you give others who would like to attempt such a strategy?*

Dr. Needham: *Yes, this is now the standard of care in my MICU after we completed a quality improvement project on this issue.[7] We published a "how to" guide for this type of quality improvement and have two educational websites and an international network of ICUs embracing these concepts — www.mobilization-network.org and www.hopkinsmedicine.org/OACIS.*

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Emerging Role of the Respiratory Therapist and the Diagnosis of Alpha-1 Antitrypsin Deficiency

by James K. Stoller, MD, MSc, FAARC

Alpha-1 antitrypsin deficiency (AATD) is a relatively common but under-recognized condition that predisposes to COPD and to chronic liver disease.[1-4] Evidence of its under-recognition includes the finding that affected individuals often experience long delays between their first symptom and the initial diagnosis (i.e., by a mean of 7.2 years) and that individuals often see multiple health care providers before the diagnosis is first recognized.[5-7] As further evidence of under-recognition, of the estimated 70,000–100,000 Americans affected by severe deficiency of alpha-1 antitrypsin (AAT), fewer than 10% are currently receiving specific therapy for this condition, so-called intravenous augmentation therapy.[8]

In the context that AATD is common but under-recognized and may lead to emphysema, and that respiratory therapists frequently see and care for patients with COPD,[9] this paper reviews the important role that RTs may play in helping to establish the diagnosis and manage individuals with AATD.

Clinical overview of AATD

By way of overview, the most common clinical manifestation of AATD is COPD with an emphysema predominate phenotype. COPD may occur at an unusually early age (e.g., mid-40s) and may occur among non-smokers, those with a minimal smoking history, and heavy smokers. Other manifestations include liver disease (e.g., liver scarring [cirrhosis] or liver cancer [hepatoma]), panniculitis (an uncommon manifestation characterized by skin ulcers that are often painful), and vasculitis (inflammation of the blood vessels of a specific type, called c-ANCA positive vasculitis).[1-4] Because estimates suggest that a majority of patients with severe deficiency of AAT may develop some degree of COPD, and perhaps up to 40% may develop liver disease, RTs caring for patients with COPD are poised to help identify affected individuals and to assist in establishing the diagnosis of AATD.

AATD is a genetic disease, inherited as a so-called autosomal co-dominant condition. This means that affected individuals must inherit one severely deficient gene from each parent in order to develop a severe deficiency state. AAT genetic typing is defined by the so-called PI nomenclature system, where PI stands for **P**rotease **I**nhibitor, a major function of the protein AAT. Approximately 97% of Americans carry two copies of the normal allele (M), and are so-called PI MM. Many abnormal genes have been described (>120 to date), of which the one most commonly associated with severe deficiency is the so-called Z allele. Approximately 3% of Americans are carriers of the Z allele (or "heterozygotes," so-called PI MZ individuals), and approximately one in 3,500 Americans are estimated to carry two copies of the severe deficient allele, so-called "homozygotes" or PI ZZ individuals.[1-4]

These latter individuals are recognized to be at markedly increased risk for COPD. As in all patients with COPD, the diagnosis is established by performing spirometry with bronchodilators and establishing the presence of fixed airflow obstruction post-bronchodilator. The criterion for COPD is often suggested to be an FEV_1/FVC ratio <0.7 or an FEV_1/FVC ratio below the 5th percentile based on reference equations for the individual's gender, height, and age.

about the author...

James K. Stoller, MD, MSc, FAARC, is the Jean Wall Bennett Professor of Medicine and chair of the Education Institute at the Cleveland Clinic in Cleveland, OH.

Rationale for diagnosis and the role of respiratory therapists

Given that AATD can predispose to COPD, one might ask what difference it makes to establish the diagnosis.

The rationale for early diagnosis and for involvement by knowledgeable RTs is several-fold:

1. Common interventions and treatments for COPD, including tobacco-dependence treatment, are appropriate and important as early as possible in the hope of averting accelerated decline of lung function in AAT-deficient individuals. The pathogenesis of AATD-related emphysema suggests that cigarette smoking may be particularly threatening to deficient individuals, who lack protection against proteolytic enzymes in the lung that can break down lung tissue and are present in increased amounts as a result of cigarette smoking. RTs can play an important role in reinforcing smoking cessation. Also, population screening data suggest that individuals who are aware of being AAT deficient are less likely to start or to continue smoking.

2. Beyond providing an opportunity to intervene early with regard to smoking cessation, the diagnosis of AATD potentially allows occupational choice and lifestyle changes (i.e., avoiding dusty occupations), characterization of other family members' risk for having severe deficiency of AAT, and the possibility of initiating intravenous augmentation therapy. Though beyond the scope of this review, intravenous augmentation therapy involves the intravenous infusion of purified AAT in order to restore serum levels in individuals whose levels are below normal as a result of their severe AAT deficiency status.[8]

Since AATD is common but under-recognized and may lead to emphysema, RTs are positioned to help establish the diagnosis and also manage individuals with AATD.

Official guidelines endorsed by the American Thoracic Society, European Respiratory Society, American College of Chest Physicians, and American Association for Respiratory Care[2] have been published regarding the diagnosis and management of individuals with AATD. These guidelines strongly recommend testing all symptomatic adults whose post-bronchodilator spirometry results show fixed airflow obstruction. Also, testing for AATD should be done in first-degree relatives of affected individuals (e.g., siblings, children), individuals with panniculitis, symptomatic adults with airflow obstruction and either smoking exposure or occupational exposure, and individuals with unexplained liver disease.

Establishing the diagnosis is relatively simple and is based on a blood test to determine the serum AAT level and the genetic composition of the affected individual, characterized either by the type of AAT proteins present in the blood (phenotype) or the types of genes present (genotype). Many commercial tests are available and are relatively inexpensive. Notably, several companies that manufacture drugs for AATD make available free test kits that will assay the individual's serum level of AAT as well as the genetic composition (i.e., genotype).

In addition, free, confidential home testing is available through a study sponsored by the Alpha-1 Foundation.[9] In the Alpha-1 Coded Testing study (ACT), individuals receive a test card at home, produce a small blood spot that is placed on the card, and submit by mail, with the expectation of receiving a confidential report at their home regarding their AAT genotype several weeks thereafter. In the context that testing for AATD is easy to perform and may be free to the patient, the impetus for testing and the opportunity for RTs to enhance recognition is increased. Specifically, RTs are in an excellent position to ask COPD patients whether they have been tested for AATD and, if not, to discuss options with them for doing so. In particular, they may bring to patients' attention the availability of free home-based testing.[10] RTs can also discuss testing and testing options with the managing physician.

Emerging evidence supports the idea that RTs can make an important contribution to diagnosing and managing individuals with AATD.[9] For example, in a recently conducted study, RTs and pulmonary function technicians were empowered to approach patients referred to a pulmonary function laboratory for spirometry and found to have fixed airflow obstruction with regard to their willingness to be tested for AATD. Among the study subjects tested at the 19 participating U.S. medical centers, individuals were found to have severely deficient genotypes (PI ZZ or PI SZ), and an increased number above the expected population frequency were characterized as heterozygotes for a deficiency allele.

The study demonstrated the important role and capability of RTs to enhance detection of AATD. Similarly, RTs serve as key members of the pulmonary rehabilitation teams who commonly care for patients with COPD, including AATD. Finally, with the prospect of future therapy involving the inhalation of purified AAT,[11] it is likely that RTs will assume roles in helping to administer therapy and as educators to help affected patients cope. To

Alpha-1 Course Coming Soon

As Dr. Stoller points out in his article, respiratory therapists have a significant role to play in helping to identify chronic lung disease patients who may be suffering from alpha-1 antitrypsin deficiency (AATD). Thanks to a grant from the Alpha-1 Foundation, the AARC will soon debut a new online course aimed at providing you with everything you need to know to fulfill that role in your facilities.

The Alpha-1 course will cover all the basic information about AATD, including how it differs from COPD, how it is treated, and why it is important to differentiate the condition from COPD in affected individuals. From there, you'll learn more about how you can get involved in offering AATD diagnostic testing to COPD patients who come to your pulmonary function laboratory for evaluation of their lung disease.

So stay tuned to the AARC website for more on this new course and then consider how you can put it to work to help identify more people with AATD earlier in the course of the condition. Participants who take the course and pass a post-test will earn CRCE credit. ■

this end, the American Association for Respiratory Care is currently developing an educational program to enhance RTs' awareness of AATD and their capability to help affected patients (see sidebar).

Presence and promise

In summary, because AATD can produce potentially debilitating COPD and is under-recognized, and because effective interventions are available and RTs play important roles in the care of patients with COPD, RTs play a crucial role in both helping to identify and manage affected individuals. Examples of specific current roles include prompting suspicion and testing for AATD and participating in the patient's care (e.g., pulmonary rehabilitation, tobacco-dependence counseling, etc.). Evolving roles will likely include administering aerosolized augmentation therapy with purified AAT. The presence and promise of these critical roles encourage continued learning by RTs about this important condition. ■

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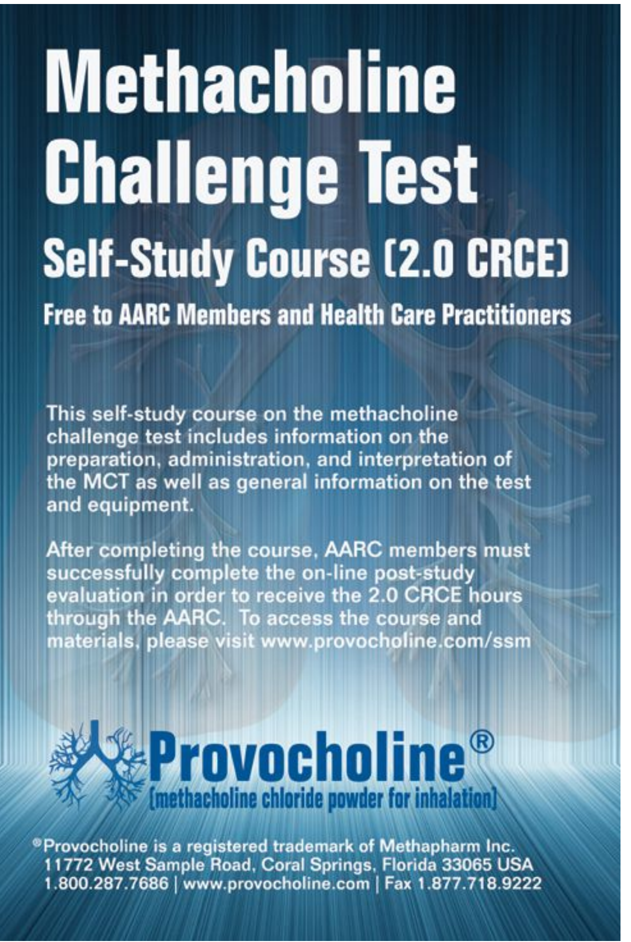

Adapting Aerosol Devices to the Needs of the Geriatric Patient

by Robert Messenger, BS, RRT, CPFT

It is well recognized that the U.S. population is aging. In 1950 the 65+ age group accounted for only 8.1% of Americans. Today that segment has grown to 12.4% and is projected to hit 20.4% by 2050.[1] Over the past decade, the prevalence of chronic bronchitis and emphysema in the elderly population has remained relatively stable, at 5.6% and 5.4% respectively.[2] However, the combined effect of general population growth and expansion of the elderly segment has resulted in continuing growth of the COPD population.

Comorbidities complicate effective treatment

Treatment of this expanding COPD population is often complicated by the presence of comorbidities. A preliminary report from a recent European study indicates that rheumatoid arthritis is twice as likely to be present in persons with COPD.[3] Additionally, studies have demonstrated a direct relationship between COPD severity and level of cognitive impairment.[4,5] This can be further complicated by the prevalence of Alzheimer's disease, with 13% of 65-year-olds displaying symptoms, a figure that expands to 43% by age 85.[6] Also, the incidence of Alzheimer's disease almost doubles if there is a history of cigarette smoking.[7]

It is incumbent upon respiratory therapists to be aware of these comorbidities when evaluating and training COPD patients on self-administered aerosol therapies. In particular, any perception of diminished cognition should be met with efforts to reduce the number and variety of devices and instructions that the patient must master. Also, as we consider appropriate aerosol modes for patient self-administration, we need to consider loss of strength due to muscle wasting (sarcopenia) and age-related reduction in visual acuity.

about the author...

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The chronic management of COPD requires that patients take responsibility for self-administration of medications. Given the aforementioned frequent physical and cognitive limitations, it is essential to minimize complexity and remove as many barriers to self-treatment as possible. While traditional small-volume nebulizers (SVNs) continue to be used, their relative advantages have been largely offset by the convenience and simplicity associated with pressurized metered-dose inhalers (pMDIs) and dry-powder inhalers (DPIs). Studies that have compared the clinical outcomes of the same drug administered by SVNs, pMDIs, and DPIs have mainly reported similar efficacy.[8,9] The primary practical advantages of pMDIs and DPIs are that their relatively brief treatment times impose less disruption on the patient's normal activities, and they don't require the extensive cleaning and sterilization associated with home aerosol equipment.

Small-volume nebulizers

That said, traditional constant-output SVNs are ideal for elderly patients who have difficulty coordinating pMDI activation with their breathing. Although SVN treatment times are longer, these devices allow the medication to be delivered over many breaths, eliminating the potential for a single ineffective breath to reduce the efficiency of the treatment. Effective medication delivery can be achieved even with low inspiratory flow rates; and an inspiratory pause, or breath-hold, is not required. SVNs also allow simultaneous nebulization of multiple drugs, although this relative advantage has been somewhat offset by metered-dose inhalers (MDIs) that offer drug combinations.

Of course, during periods of clinical stability, the longer treatment times associated with SVNs can be per-

ceived as an imposition and, as a result, compliance with therapy may be reduced. In addition, many older patients with physical limitations may not be capable of performing the cleaning, sterilization, and storage procedures that must be followed to reduce the potential for infection. Yet another concern for patients with chronic disease is the fact that nebulizers, tubing, and compressor filters must be periodically replaced. Replacing a nebulizer with one of a different brand or model, or even switching between durable and disposable versions of the same model, can cause the patient confusion when cleaning and assembling, as well as affect treatment times, particle size distribution, and delivery efficiency.

Metered-dose inhalers

Many elderly people continue to maintain an active lifestyle, even in the face of chronic respiratory disease. For even moderately active individuals, MDIs and DPIs offer the least lifestyle disruption and may promote greater therapeutic compliance.[10] MDIs are compact and highly portable, they require no external power source, and treatments (usually consisting of one to two breaths) are limited to one to two minutes or less. These advantages, however, come with a cost.

For seniors with physical limitations, the greatest challenge to effective MDI use is the coordination of canister activation and inspiration. Also, they must possess the cognitive skills needed to properly sequence all the steps involved in effective MDI use. Studies of proper MDI use by COPD patients offer large disparities in the reported outcomes. For instance, one study reported a 90% error rate in the performance of all essential MDI steps.[11] Those results contrast sharply with a recent European study that found only a 12% critical error rate.[12] The differences in these results are largely due to differences in the way each study was designed. However, what these and other studies[13,14] illustrate is the need for clear instruction combined with follow-up reinforcement of training by practitioners skilled both in the knowledge of proper MDI use and in the art of patient education.[15,16]

Spacers have been repeatedly shown to improve aerosol deposition and reduce oropharyngeal impaction.[17,18] While larger spacers may provide for slightly greater aerosol deposition, they lack the practical convenience that smaller devices offer to the active chronic user. Given the significance of "ease-of-use" in influencing therapy compliance, it is important for the respiratory therapist to consider spacer size along with performance when providing, prescribing, or recommending these devices.

When selecting the aerosol delivery approach that best fits the clinical and lifestyle needs of our geriatric patients, consider the medication and dosage, frequency of treatment, patient strength, and ability to coordinate inspiration with device activation.

Dry-powder inhalers

DPIs offer the elderly patient the combined benefits provided by both SVNs and pMDIs. DPIs use the patient's inspiration to generate sufficient turbulent flow to disperse the powder for inhalation. The key patient-dependent factor is that the patient must be able to generate and sustain a minimal peak inspiratory flow rate of 35–60 Lpm — depending on the specific device. Since inspiratory flow is the trigger for device activation and release of powder, the need for the patient to coordinate device activation with inspiration is effectively eliminated.

The effectiveness of DPI drug delivery can be hampered by exposing the dry powder to humidity, which may result in clumping. To avoid clumping, patients should be taught to first exhale, then raise the device to their mouth for activation with the next inspiration. Instruction should also be provided to ensure that devices are stored in a low-humidity location between uses. Attention to these humidity-related considerations will enhance the effectiveness of this convenient form of self medication.

Many options

With all these options, today we have many devices to choose from when selecting the aerosol delivery approach that best fits the clinical and lifestyle needs of the geriatric patient. Factors that must be considered include the medication and dosage, frequency of treatment, patient strength, and ability to coordinate inspiration with device activation. Because cognitive impairment is strongly associated with COPD in the elderly,[5] efforts should always focus on reducing device confusion by minimizing the number and types of devices the patient must use. Breathing technique, inspiratory speed, and

breath-hold are just some of the patient performance factors that can easily be confused when different devices are used; and the likely result is ineffective therapy. In the end, acceptance of and compliance with the prescribed therapy is largely determined by the attention given to the patient's mental and physical abilities. Achievement of these goals rests with the time and effort respiratory therapists devote to training their geriatric aerosol patients. ■

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If It Seems Too Good To Be True…

by Anthony L. DeWitt, JD, RRT, FAARC

One of the most common observations in consumer law is that "if it seems too good to be true, it probably is." Whether you're buying respiratory equipment from an online store or signing up for educational classes at an online university, you should never take it for granted that you're dealing with an honorable and lawful organization. As President Ronald Reagan once observed, "trust, but verify."

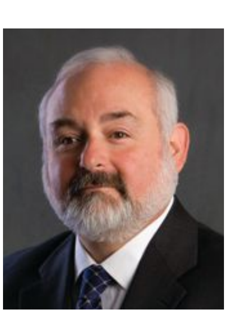
One thing is certain about doing business online. There are bargains galore. Whether you're buying Christmas dishes on eBay or books on Amazon, the price of goods available online is often less. Online stores don't need salesmen. They have lower overhead. Both of these can be an advantage for certain kinds of consumer goods.

The problems come up when what is advertised is not delivered — or what is delivered is not in the condition promised. When Amazon makes a mistake and ships the wrong kind of coffee, it stands behind the transaction and makes good on it. Most other online merchants do the same thing. But not all of them do, and before doing business with a supplier — particularly a supplier of medical equipment or disposable supplies that has a website but no salespeople — some investigation is in order.

Suppose that you want to buy infant ventilator circuits from Esmerelda's Quick Ship Medical Equipment.* You go to Esmereldasquickship.com and find dual limb ventilator circuits for $199 for a case of 30, far less than the $475 your local supplier charges you. The only requirement is that these supplies must be purchased online with a credit card through the website. Should you make the purchase?

*Esmerelda's doesn't exist. It's a made-up name for this example.

about the author…



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Better Business Bureau

The first step is to visit www.bbb.org and check out the business or organization using the Better Business Bureau Online (BBBOnline). Not all businesses seek accreditation from the Better Business Bureau, but many do. A BBB online rating can give you confidence in the product or service being offered, and also offer you a chance to determine how many complaints may have been filed against the organization. Many businesses don't register with the Better Business Bureau, however.

Online complaints

If the business isn't listed by the Better Business Bureau, another potential source of information about businesses is www.Complaintnow.com. ComplaintNow does not attempt to resolve disputes like the Better Business Bureau but does allow businesses to respond to complaints made by consumers. A business with a lot of complaints might be a business you wish to avoid.

The final step, of course, is to "Google" the business name and check for complaints: "esmereldasquickship.com and complaints." Sometimes Google will turn up information that other complaint services will not (e.g., information from online forums). If you can't find any information about the business, the final step is to go to the state where the business is registered and look at the business information provided by the Secretary of State's office in that state.

Every incorporated business or LLC, and every entity doing business under an assumed name must register with the Secretary of State in the state where they are incorporated or set up. For example, in Missouri, the Secre-

tary of State's website is found at www.sos.mo.gov and under the category of businesses and general services you will find "Search for a business." When the search page comes up, type in the word "penumbra." Three businesses show up. Looking at the page we can see that two entities are "limited liability companies" and the third is a "fictitious registration." These businesses have been in operation since 1999, 2005, and 2008. None of them are new registrations. If they were, they might trigger some concerns about whether the business was legitimate.

More troubling would be the lack of any registration. When a person gets a domain name through a service like Earthlink or Go Daddy, nothing requires that the person establishing the domain name prove that it is a legitimate business. It does not have to show its corporate status. Anyone can go on the Internet and buy the domain name "esmereldasquickship.com" without much more than a credit card, and they can hide the information by requesting privacy from the domain registrar. Instead of being Esmerelda's, Inc., the company could be the sole creation of another Charles Ponzi. If a company uses the designation of "Inc." or "LLC," uses the word "corporation" in its name, or is organized as a partnership, limited partnership, or limited liability partnership, it must be registered with the Secretary of State where it is found. If it is not registered, then it is not legitimate.

Internet Archive

Another way of checking on the legitimacy of a website is to log on to Internet Archive, sometimes called the Wayback Machine. The Wayback Machine lets you examine a website to determine how long it has been operating and how many different versions have been in place. It can be found at www.archive.org. Enter the name of the website (e.g., www.aldewitt.com) and you can see when the site was set up, when it was updated, and what content was on the site previously. Again, a website that appeared in the last month is probably not a website with a sufficiently long track record to evaluate whether the company is a good place to do business.

The final check, however, is to look at what's being offered and whether it meets the "smell test." If a product you would normally pay $475 a case for is advertised at $199 a case, something is probably not right. The price seems too good to be true. Combined with no listing on BBBOnline for Esmereldasquickship.com, this is a "deal" you should probably pass up.

Keep in mind that when you purchase a product with a credit card you are usually protected from fraud. Yet, that doesn't mean there are no consequences. When you buy online and provide a buyer with your corporate credit card and your card security codes, that buyer now has everything he or she needs to charge other items on other websites using your corporate information. While your fraud liability is limited by your agreement with the card provider, you still will need to get new credit cards and assist the card issuer with ferreting out valid charges from invalid ones. That's a hassle no one needs.

These are all good reasons that it is a good idea to ensure that any website you do business with either has Better Business Bureau registration or can demonstrate a long history of providing good service. It's also a reason to do business with providers that have representatives and that make sales calls on you personally. The website should be a convenient way to order, not a mandate. Sales people make their living by being the person to call when things go wrong, and they earn that money every day. ■

Government Affairs Year-end Wrap-up

by Cheryl A. West, MHA, Miriam O'Day, and Anne Marie Hummel

Our AARC Government Affairs staff spent 2011 addressing numerous issues and advancing the profession's legislative and regulatory agenda. At both the state and federal levels of government, elected officials and policymakers were keenly focused on budgetary and financial issues, and it was clear that these economic concerns drove the direction of laws, rules, and policies.

The AARC also continued its long-established policy of partnering with state societies, patient/consumer associations, and "like-minded" organizations on respiratory and pulmonary issues. State and federal laws, and the regulations/guidelines that detail and interpret the laws, can profoundly impact not only the requirements to be licensed as a respiratory therapist but also dictate what services and under what circumstances you may provide respiratory care services to your patients.

State legislation and regulation

Given the continuing financial pressures on all state governments, there was limited legislation that expanded state health benefits during the past year. Simply put, state governments had to address an increased demand for services from their citizens with fewer resources to meet those needs. Passing legislation to expand state-provided health and clinical services, which could have included respiratory therapy services, was not on the legislative agenda.

It was clear during the past year that state legislatures looked for ways to increase revenues. States addressed their budgetary crunch in a variety of ways, including increasing licensure fees, raising taxes on tobacco products, and increasing the cost of providing state services (e.g., requiring higher entrance fees at state parks and facilities and charging higher tuition for state colleges).

about the authors...

Cheryl A. West, MHA, serves as director of government affairs for the AARC. Miriam O'Day serves as director of legislative affairs for the AARC; and Anne Marie Hummel is the AARC's director of regulatory affairs in Washington, DC.

Some states introduced, if not passed, legislation that legally expanded the scope of practice for a number of para-professional occupations and disciplines. This last effort is of some concern for the respiratory therapy profession as it appears states are looking for ways to substitute other less expensive health care workers to provide state-sponsored health services that have traditionally been provided by respiratory therapists, nurses, or other licensed health care professionals. Noteworthy examples include the following:

- **Texas, Montana, West Virginia,** and **Oklahoma** increased the scope of service for certified medication aides.
- **Minnesota** recognized a "community paramedic," which defined the paramedic as one who could, among other things, be directly reimbursed when providing services in the home setting, including monitoring and managing patients with chronic illnesses. The Minnesota Society for Respiratory Care and the Minnesota Nurses Association inserted important training and test requirements into the final bill to address earlier concerns.

There were bright spots as well this past year, with more states recognizing the diagnosis of COPD. Recognition generally took form with state agencies devising ways to track the incidence of COPD rather than developing specific programs to manage the care of those with COPD. **Texas** passed a bill that would add COPD as a diagnosis that could be monitored by telemedicine services.

Several states passed new laws that specifically impacted the respiratory therapy profession and could set examples for other states.

- **Alabama** will pay for enhanced Medicaid reimbursement for ventilator units in nursing homes and require 24/7 staffing of these units by licensed respiratory therapists.
- **Florida and Illinois** will increase Medicaid payments to nursing homes for patients who are "technologically and respiratory dependent" (Florida) and ventilator dependent (Illinois).
- **Maine** will require specific professions (RTs included) to report any perceived elder abuse.
- The Respiratory Care Society of **Washington** supported legislation permitting RTs and other allied health professionals to accept orders from non-physician practitioners such as physician assistants and nurse practitioners in addition to physicians. This action is consistent with similar changes made by Medicare.
- The **Virginia** Society for Respiratory Care, working with other health care professional organizations, supported a law that permits licensed health professionals involved in patient transport, including RTs, to enter Virginia without having to obtain a Virginia professional license.
- The **North Carolina** Respiratory Care Board issued a declaratory ruling that provided a "transport" exemption specifically for respiratory therapists coming into North Carolina from another state.
- The **West Virginia** Respiratory Care Licensure Board issued a statement permitting a license exemption for transport RTs entering the state.

Congressional legislation

Congress spent most of 2011 in rancorous debate over debt limits, spending cuts, and budget negotiations. When the debt ceiling was raised in August last year, a bill was passed that dictates there must be federal spending cuts in the amount of $1.2 to $1.5 trillion over the next 10 years. This strategy left Congress with an ultimatum that if they did not vote on agreed spending cuts by Dec. 23, 2011, an automatic trigger would take place.

The "trigger" will be $500 billion in cuts to defense spending and a 2% reduction across the board to the Medicare program over the next 10 years, equaling a total of $1.2 trillion. The Joint Deficit Reduction Committee (also referred to as the "Super Committee") comprised of six Republicans and six Democrats from the House and Senate were tasked with the job. A majority of seven members must agree to the legislation to have it introduced. Individual members of Congress had until Oct. 14, 2011, to weigh in on their suggestions with the Super Committee. As of this writing, there was no plan introduced by the Super Committee.

If the across-the-board 2% cuts are taken in Medicare, they will be passed along to physicians. It is important to note that the Sustainable Growth Rate (colloquially referred to as the "Physician Fee Fix" or "Doc Fix") has to be adjusted again by December 2011. It is predicted that the Sustainable Growth Rate "pay-for" will be other cuts to Medicare and may be the time when Congress truly has to consider substantive ways to contain costs within the Medicare program. However, changes to this and other health programs still remain to be determined.

The Medicare Respiratory Therapy Initiative — H.R. 941: Despite Congress' focus on budget issues, the AARC did not forsake our advocacy efforts in Washington, DC; and we continued to lobby for H.R. 941, our Medicare Respiratory Therapy Initiative legislation. Throughout 2011 we met with the key health staff on the committees that have jurisdiction over Medicare to ensure our issue remained on the members' radar screens.

You may recall just prior to the AARC's annual "Hill Lobby Day" in Washington, DC, that we launched a Virtual Lobby Week where we asked RTs, respiratory therapy students, pulmonary patients, and their caregivers to email Congress requesting support for our Medicare Respiratory Therapy Initiative. This was a very successful effort, with over 10,000 messages going to Capitol Hill. We also initiated targeted efforts on getting emails and letters from specific state societies directed at their senators and representatives who were in key committee positions. We thank the state societies from Colorado, Michigan, Pennsylvania, and Washington State for activating specific letter-writing campaigns.

COPD Congressional Caucus: The AARC continued its work with the U.S. COPD Coalition (USCC) to introduce legislation addressing COPD. Additionally, the USCC initiated several important events and activities during 2011:

- Hosted a congressional briefing in October 2011 featuring NASCAR driver Danica Patrick
- Identified Sen. Richard Durbin (D-IL) to serve as the Senate co-chair of the Congressional COPD Caucus with Sen. Mike Crapo (R-ID)
- Placed appropriations language in the Senate Labor Health and Human Services bill directing

the National Heart, Lung, and Blood Institute to convene a meeting focused on the creation of a national action plan to address COPD.

Based on USCC meetings held in the spring of 2010, the Centers for Disease Control and Prevention (CDC) released its final report **"Public Health Strategic Framework for COPD Prevention."**

Coalition activities: Over the past year, the AARC partnered with a number of coalitions to advance particular legislation and/or regulations in Washington, DC. Our partners include the Coalition for Biomedical Research, the Coalition for Public Health Funding, the Supporters of Health Care Workforce, the Asthma and Allergy Foundation Coalition, and the Tobacco Partners.

In previous years our participation with certain coalitions was focused on urging greater funding for health and disease research to promote issues that will enhance the clinical support of patients with particular illnesses. This year the efforts to reduce the deficit by cutting discretionary spending has refocused the efforts of many of these coalitions to attempt to maintain current funding rather than seek increases.

Federal regulations and other issues

Pulmonary Rehabilitation: The past year was not kind to pulmonary rehabilitation. We saw a final payment rate set by the Centers for Medicare and Medicaid Services (CMS) for calendar year 2012 at $37 per hour, per session, a substantial reduction from the 2011 $63 payment rate. The change was due to an analysis of charges hospitals identified on their claims submitted to Medicare using the new code (G0424) established specifically for the pulmonary rehabilitation benefit that was not available when CMS developed the 2010 and 2011 payment rates.

AARC, together with other nationally recognized pulmonary organizations, met with CMS in late August during the public comment period and strongly opposed the payment reduction. We cited reasons why we believed the data hospitals reported were inaccurate and gave specific recommendations that would enable CMS to fix the problem. Unfortunately, CMS maintained in the end that they had "robust" data upon which to make their final decision.

The fight is not over for us. AARC and our sister organizations are planning another meeting with CMS in early 2012 before they start to develop the next payment update for pulmonary rehabilitation services to discuss long-term solutions that will keep these important pulmonary rehab programs viable for our patients whose lives depend on it.

Quality Initiatives: Hospital incentive payments linked to reporting and performance of quality measures, improved access to coordinated care across health care settings, and reducing hospital readmissions were at the forefront of federal regulations during 2011. For further information, an in-depth discussion of the key quality initiatives in the Medicare program were reported in the December 2011 *AARC Times*. "Goverment Advocacy" column on **page 13**.

During 2011, CMS also proposed adding two hospital-level quality reporting measures related to COPD to be included in future public reporting. These include 30-day all-cause mortality and 30-day all-cause readmission following hospitalization for acute COPD exacerbations. We expect this will be part of the Hospital Compare website where Medicare beneficiaries can look at how well hospitals in their area are doing on certain quality outcomes.

Respiratory therapists are encouraged to find out more about what their hospitals are doing to meet these goals. There are excellent opportunities for RTs to help their hospitals achieve high marks in caring for patients with COPD.

Competitive Bidding: Plans for Round 2 to expand the program to 91 metropolitan statistical areas were announced in mid-August 2011 with bids expected to begin in the winter of 2012. ABT and Associates, an independent research firm hired by CMS to evaluate the impact of competitive bidding on both DME suppliers and Medicare beneficiaries, included AARC in its interviews of relevant stakeholders. Other evaluations on the impact of patient access are expected in 2012. AARC supports repeal of this program.

Reduced Regulatory Burdens on Hospitals: As part of a government-wide effort to eliminate burdensome regulations, CMS proposed in November 2011 easing some of the requirements contained in the Hospital Conditions of Participation. Of particular interest to the respiratory community is the proposal to provide greater flexibility to hospitals to establish and authenticate standing orders and protocols if they meet certain conditions (e.g., evidence-based). However, hospitals would still be expected to include specific criteria by which a nurse or other authorized personnel could initiate the execution of such orders and protocols.

(continued on page 71)

Topics For Professor's Rounds 2012

- **The Mandate to Reduce Hospital Readmissions - How Respiratory Therapists Can Help**
John R. Walton, MBA RRT FAARC
Sam Giordano, MBA RRT FAARC
Item # PR20121

- **Medical-Legal Implications of the Changing Health-care System for Respiratory Therapists**
Anthony L DeWitt, JD RRT FAARC
Tom Kallstrom, MBA RRT FAARC
Item # PR20122

- **Reducing Cost While Adding Value - Critical Roles for Respiratory Therapists**
Rick Ford, BS RRT FAARC
Douglas S. Laher, MBA RRT
Item # PR20123

- **Managing the Chronically Ill Pediatric Respiratory Patient**
Bruce K Rubin, MD MEngr MBA FAARC
Timothy R. Myers, BS RRT-NPS
Item # PR20124

- **Educating Patients with Chronic Respiratory Disease – RTs Make the Difference**
Timothy R. Myers, BS RRT-NPS
Tom Kallstrom, MBA RRT FAARC
Item # PR20125

- **Palliative and End-of-Life Care: What Respiratory Therapists Need to Know**
J.Randall Curtis, MD MPH
Dean Hess, PhD RRT FAARC
Item # PR20126

- **Get 'Em Movin' - Early Mobility for Ventilator-Dependent Patients**
Eddy Fan, MD FRCPC
Dean Hess, PhD RRT FAARC
Item # PR20127

- **Improving Patient Safety - How Respiratory Therapists Can Contribute**
Item # PR20128

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Pulmonary Rehabilitation and Access Challenges

by Sam P. Giordano, MBA, RRT, FAARC

As all of us in the respiratory care provider community are aware, pulmonary rehabilitation is by far one of the most sound investments our health care systems can make worldwide. It improves quality of life of COPD patients, decreases hospital admissions/readmissions, and lowers rates of exacerbation. Yet, we still face challenges in expanding access to pulmonary rehabilitation programs. The long and the short of it is: There is no one reason, but several. Let me take this opportunity to point a few of them out to you and ask you to address them on behalf of our patients.

Worldwide problem

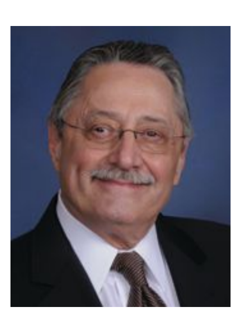
First, let's understand this is a worldwide problem. It's not unique to the United States. There are far too many COPD patients who are not referred to pulmonary rehabilitation programs. There are also patients who would be referred to these programs if they existed. Even if they were referred and the program did exist, many of these patients will not participate because they do not understand the details of the program itself. They are not well informed regarding the benefits that are manifest in such programs if they choose to participate.

The worldwide respiratory care community has done a wonderful job in making policy makers in countries around the world aware of the evidence that supports the benefits of pulmonary rehabilitation for COPD patients. We've had many successes in terms of developing positive coverage decisions. However, in some instances, even though the coverage is in place, the payment for the service is too low to provide an incentive for hospitals, clinics, and other settings to establish a fully resourced pulmonary rehabilitation program.

Here in the United States we have succeeded in getting a national coverage determination, and many private insurance companies also pay for this needed service. From a compassionate perspective, it's the right thing to do for our patients and has been proven scientifically valid. However, if we were just looking at it from a business or economic perspective, it's a great investment since it has been proven to lower exacerbation rates, hospital admissions, and readmissions. It is truly, as my grandfather used to say, an opportunity to spend a dime now to save a dollar later. So, what's the problem? First of all, let's think about how patients come to be involved in a pulmonary rehabilitation program. Many referrals quite naturally flow from lung disease specialists (e.g., pulmonologists) while others are often referred to the program by general practitioners, family practitioners, and other medical specialists not primarily involved in pulmonary medicine.

However, given the vast numbers of COPD patients who are seen by non-pulmonary medicine physicians, it is imperative that we as respiratory care providers do a better job of marketing the benefits of pulmonary rehabilitation. This will help guide physicians to make the right choice for their patients with COPD.

about the author...



Sam P. Giordano, MBA, RRT, FAARC, serves as AARC executive director. He can be reached at (972) 243-2272 or giordano@aarc.org.

Think about what you can do

You may want to take a minute to think about how you can make the broader physician community aware of the evidence and, therefore, the benefits of the program. Volunteer to provide presentations at local, regional, and national medical meetings. The proof is in the scientific literature. All you have to do is share it with your target audience. The result will be more referrals to pulmonary rehabilitation programs, improved quality of life for our patients, and more prudent health care expenditures.

The next phase is to assure that there are adequate numbers of pulmonary rehabilitation programs. When we

succeed in getting all COPD patients who qualify for pulmonary rehabilitation to get that important referral from their attending physician, we don't want to be sending them down a dead-end road. To accomplish this, we have to advocate for our patients through coverage determination (and we've made great strides in this area).

However, we've also got to ensure that reimbursement rates are adequate to cover the cost of the program. This is currently a challenge and one that we are addressing along with other members of the respiratory care community. This challenge occurs both at national and state levels, and within the private payer community as well. But our message should be clear. Access to pulmonary rehabilitation programs is not only the right thing to do for our patients — it is the smart thing to do with our money.

Advocate for pulmonary rehab

Now, let's assume we've addressed the forgoing challenges successfully. Next challenge: How do we get patients to participate and sign on for the whole program? This is where your ability to educate your patients rises to a top priority.

Some patients are afraid to participate in pulmonary rehabilitation. I recently read a case study from the United Kingdom. In this case study, albeit anecdotal, some patients were afraid to participate because of their breathlessness. The mediation occurred when the service was "rebranded" based on feedback obtained from patient surveys. New informational materials were created that highlighted the dramatic improvement in patient's lives because of the program. Other tools were used to reinforce this message, and the results were positive. More patients participated because the fear was overcome with information that was factual.

As our health care system worldwide continues to evolve, in order to balance the economic and clinical imperatives we must continue our efforts to advocate for our patients, especially in the area of improved access to pulmonary rehabilitation programs. There's ample evidence throughout the world that it's a win-win scenario first and foremost. The patients are better off, and a close second is that the health care systems operate in a more cost-effective manner.

I realize that you all have many pressures related to your work and you endeavor to meet your patients' needs. I also realize it's a lot easier to give advice than to act on it. But, please, on behalf of our patients — especially those with COPD — let's get this done once and for all. We owe it to our patients, and we owe it to the future of the worldwide health care systems. ■

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Management of the Ventilator-dependent Patient with ICU Psychosis

by Felix Khusid, BS, RRT-NPS, FAARC

Intensive care unit (ICU) psychosis is a form of brain dysfunction that affects a large percentage of ICU patients costing $4–16 billion annually.[1–5] Much of the cost related to ICU psychosis comes from loss of income due to work absence, financial burdens on caregivers, and the expense of rehabilitation linked to increased length of stay in the ICU. The increased length of ICU stay results in a decrease in cognitive abilities. This affects the activities of daily living that most of us take for granted. Improving this situation in patients who survive hospital stays with ICU psychosis requires time, expertise, treatment, and funding.[6] Multiple preexisting risk factors may contribute to the development of ICU psychosis, especially patients who are ventilator-dependent. Advanced age, preexisting baseline dementia, language barriers, depression, dehydration, hypertension, congestive heart failure, sepsis, hypoxia, electrolyte imbalances, metabolic disturbances, seizure disorders, pain, and psychoactive medications, smoking, alcoholism, and drug abuse are all contributing factors. Also, initiation of corticosteroids or sudden discontinuation after prolonged administration may be linked to development of ICU psychosis.[1–5]

about the author...

Felix Khusid, BS, RRT-NPS, FAARC, is the respiratory care director at New York Methodist Hospital in Brooklyn, NY.

Classification

ICU psychosis is often referred to as delirium. Delirium is a disturbance of consciousness with inattention accompanied by a change in cognition that develops over a short period and fluctuates over time.[7]

Behavior changes are used to classify the disturbance. Patients are classified as "hyperactive" when they are not assessed as being at mental status baseline, with inattention and disorganized thinking, as well as agitation, restlessness, and efforts to remove IVs, catheters, tubes, etc.[8] "Quiet delirium" is most often used to describe withdrawal and lethargy in the face of the ICU routine. Respiratory therapists will most likely note both types in their ICU practice.

A common occurrence in the ICU is the disruption of sleep. Outside noise stimulation (e.g., equipment alarms, verbal communication between caregivers, cell phones, and beepers) contributes to sleep deprivation.[9] Sleep deprivation can have profound physiological effects by triggering the sympathetic nervous system, which affects most bodily functions by stimulating the respiratory, cardiovascular, renal, immune, nervous, and gastrointestinal systems.

Treatment modes

Creating an ICU surrounding with less noise stimulation can minimize sleep fragmentation and can be helpful in avoiding sleep deprivation, particularly in patients beginning to recover from sustained critical illness.

It is common practice for ventilator-dependent ICU patients to be placed on benzodiazepines (e.g., midazolam, diazepam, lorazepam) and opiates (e.g., morphine or fentanyl). Fentanyl is a synthetic narcotic analgesic agent 100 times more potent than morphine; and as a short-acting analgesic it may be utilized by itself or in combination with benzodiazepines. When short-term sedation of a mechanically ventilated patient is necessary, propofol (Diprivan) may be used. Propofol is a general anesthetic agent that does not exhibit analgesic properties but rather offers rapid sedative and faster recovery effect.

Dexmedetomidine (Precedex) is a sedative that is particularly helpful during weaning trials of mechanically ventilated patients because of its exceptional ability to provide sedation without suppression of respiratory drive.

Haloperidol (Haldol) is an antipsychotic agent that can be utilized in patients with mixed and hyperactive delirium. Haloperidol typically does not result in hemodynamic instability, nor does it have sedative or analgesic effects on a patient.

Classifying behavioral changes is very important. Patients are classified as hyperactive when they exhibit changes from mental status baseline such as inattention and disorganized thinking, as well as agitation and restlessness (usually exhibited by the patient trying to pull out their lines). Quiet delirium is the withdrawal and lethargy during the ICU routine. Does your hospital or health system have a method in place to recognize delirium early and treat it appropriately?

Assessment tools

The medical literature reveals a paucity of studies devoted to delirium in the ICU, and the results are not consistent in their conclusions.[10] ICU assessment tools have been touted as being valuable in identifying patients at risk for delirium in the ICU.[1] It is important to use a validated tool for assessment of delirium in the ICU to avoid missing those patients who exhibit the syndrome.[11] Detection is important in identifying delirium in the ICU as early as possible. One of the tools available is the Confusion Assessment Method for the ICU (CAM-ICU). This tool is used in the geriatric population and can evaluate the response for non-verbal, mechanically ventilated patients.[12] As a large percentage of ICU patients are mechanically ventilated, this tool becomes extremely important for those without the ability to verbally interact with caregivers.

The appropriate approach to detecting and treating delirium in the ICU is implementing an ICU delirium detection tool for early identification of those at risk, applying the appropriate ventilator weaning or discontinuance strategy, and identifying those at risk for inappropriate use of sedation. Drug acquisition costs should be balanced against the effect on the patient, as well as the likelihood of developing delirium based on known risk factors and the use of certain drugs. The data on sedatives and opioids are conflicting. The study evaluating Safety and Efficacy of Dexmedetomidine Compared with Midazolam study (SEDCOM) showed that those receiving dexmedetomidine experienced significantly less delirium, shorter duration of delirium, and less time on the mechanical ventilator.[13] The current ventilator bundle from the Institute for Healthcare Improvement (IHI) includes spontaneous awakening from sedation to assess readiness for weaning.[15] Kress et al showed that daily interruption of sedation irrespective of clinical state or interruption at the clinician's discretion reduced time on the mechanical ventilator. Daily interruption resulted in a marked and highly significant reduction in time on mechanical ventilation.[16] Daily interruption in sedation to screen for assessment for weaning is now a key component of the IHI ventilator bundle.

Early intervention, mobilization, and physical therapy programs for mechanically ventilated ICU patients with psychosis may positively contribute to the enhancement of cognitive and physical abilities of such patients.

The main objectives of mechanical ventilation are to provide adequate alveolar ventilatory support, oxygenation, decreasing the work of breathing, and protection of the airway.[17] While ventilating a patient with ICU psychosis, every effort should be made to prevent dynamic hyperinflation of the lung to avoid ventilator-induced lung injury. Appropriately selected sensitivity levels, mode of ventilation, adequate flow-rate delivery, and a suitable targeted tidal and minute volume will have a profound affect on patient-ventilator synchrony. A clinician's ability to analyze ventilator graphics can also have an important impact in helping to recognize patient-ventilator dyssynchrony in a timely fashion. Optimizing mechanical ventilation while employing lung protective strategies may contribute to the successful management of ventilator-dependent patients with ICU psychosis.

While there are no randomized clinical trials suggesting any specific mode of ventilation as preferential, there are several new ventilatory modalities that offer some potential theoretical advantages.

Neurally Adjusted Ventilatory Assist (NAVA) — is a mode of mechanical ventilation that delivers positive airway pressure to the airway in proportion to the electrical activation of the diaphragm (EAdi) via the phrenic nerve. Respiratory drive is measured by EAdi. NAVA offers potential improvement in patient-ventilator synchrony by providing neural drive stimulation for the delivery and termination of the breath, therefore eliminating the need for the adjustment of flow or pressure triggers.[18]

Proportional Assist Ventilation — is a mode of mechanical ventilation that provides the patient with the dynamic inspiratory pressure assistance in linear proportion to patient-generated flow and volume. The ventilator applies increases and decreases in pressure in direct proportion to the patient's effort, potentially resulting in improved patient-ventilator synchrony.[19]

Adaptive Support Ventilation — is defined as dual control mode that utilizes pressure ventilation (both pres-

sure control and pressure support) to maintain a set minimum minute volume percentage. If a patient's spontaneous breathing effort is absent, the ventilator will determine the necessary tidal volume, respiratory rate, inspiratory time, and pressure limit for the mandatory breaths. Once the patient starts to breathe spontaneously, the ventilator switches to pressure support, which will be automatically titrated as needed in order to accommodate targeted minimum minute volume percentage.[20]

Involvement of RTs

Respiratory therapists should take an active role in developing interdisciplinary teams and creating additional tools to screen and track results for delirium in the ICU; including the development of protocols to facilitate early screening for readiness to wean. There are multiple examples of patients who have experienced delirium in the ICU and its associated consequences.[21] What can (or will) we do as professionals to recognize this syndrome, treat it early with teamwork, and ultimately create a positive outcome for our patients? Choose teamwork, protocols, and early detection; choose the best drugs for sedation; embrace ventilator bundles; and always remember that the patient you treat today is the family member tomorrow. ■

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Reducing Length of Stay for COPD Patients

by Joy Hargett, BS, RRT

Reducing a patient's length of stay (LOS) in the hospital is an important project for any health care facility, as an increased LOS means increased costs. With U.S. health care accounting for 17% of the gross domestic product in 2009 and expected to grow, it is imperative to control costs wherever possible.[1] With looming health care reform, health care organizations are unsure of future reimbursement payments and must take steps to facilitate cost control and cost reduction. However, quality must be maintained or improved in order to reduce readmissions.

Many COPD patients are on Medicare, and their conditions are complicated by the fact that they are 65 years of age or older and have comorbidities. Medicare patients generally represent negative reimbursement to the health care facility, meaning the patient costs more to care for than the reimbursement that is received. Due to the high cost of COPD care, it might be expected that reimbursement could be limited in the future as patient readmission rates and quality of care metrics are evaluated. Planning for potentially negative reimbursement changes is essential for organizational financial viability.

Special patient unit

Health care organizations are taking active steps to control costs, which include reducing LOS. Some also have reporting mechanisms aimed at this goal. Successes were reported when the changes in reimbursement first appeared on the horizon. In 2007, for example, MetroHealth System in Ohio experienced success with a care plan utilizing the GOLD standards along with a multidisciplinary approach. The program included other metrics as well, such as home oxygen evaluation, referrals to pulmonary rehabilitation, and smoking cessation. Program successes resulted in decreased LOS and readmissions.[2]

In 2009 and 2010, a team at St. Luke's Episcopal Hospital (SLEH) in Houston, TX, reported improvement in net margin and LOS reduction by devoting a special patient unit and specifically trained personnel to meet the needs of the COPD patient population. Care plans and physician order sets were utilized by the multidisciplinary team to standardize care.[3]

Caregivers assigned to such a unit should be trained in various aspects of COPD (disease management, nutrition, respiratory care treatments, exercise tolerance, medications, etc.) so they can assist the patient in all aspects of their care. The patient/family education process can be initiated shortly after admission by any number of caregivers. Developing standardized care plans and physician order sets allows the caregivers to be well-versed in expectations of the care delivery system that are required for success.

The availability of telemetry will be essential for some patients, as well. Pulse oximetry monitoring is important in order for caregivers to gauge the patient's oxygen needs. Personnel need to understand special considerations for the COPD patient (e.g., low oxygen saturations may be normal). Having all personnel trained in the specific care of the patient engenders collegiality among the caregivers, who are all working toward the common goal of a successful patient care experience and discharge. This allows team members to begin discharge considerations early in the hospitalization.

about the author...

Joy Hargett, BS, RRT, is the manager of respiratory care at St. Luke's Episcopal Hospital in Houston, TX.

"Traffic cop" approach

The SLEH project has been further enhanced by the development of a clinical respiratory care specialist (RCS), an advanced role for the Registered Respiratory Therapist. The RCS monitors inpatient care, provides specific education/training, and facilitates discharge for the COPD patient. The RCS may be referred to as a "traffic cop" who is directing care while assisting in a smooth flow through the system for the patient.

This role has specific goals and expectations of achieving quality and financial outcomes. The RCS also provides aftercare, with follow-up phone calls to discharged patients to ensure patients have received home equipment and/or remember how medications should be taken. Providing patients with a COPD action plan (a tool used to identify actions to improve lung health) is an excellent way to keep patients on track. To further integrate patients into a healthier lifestyle, referral to a pulmonary rehabilitation program can enhance efforts on an ongoing basis. The RCS encourages patient follow-up with the primary care physician post-discharge, as well, and becomes a hospital contact for the home patient as future needs arise.

> With looming health care reform, health care organizations are unsure of future reimbursement payments and must take steps to facilitate cost control and cost reduction.

Meeting of the minds

Conferring with physicians on a regular basis will help hospitals develop plans that assist these physicians in their daily work with COPD patients. As changing technologies, medications, and treatments appear on the market, a meeting of the minds can help vested parties plan and develop the most effective treatment regimen for these medically complex patients. By including the physician in the development of care plans and order sets, common goals can be reached.

Timely information to physicians is also an important parameter to reduce LOS. Data collection should be streamlined and readily available to busy physicians so that they have the information they need to appropriately plan for discharge. Electronic medical records can assist knowledge transfer but must be convenient and easy to use.

Physicians can also provide feedback on what will assist them in decision making. For example, physicians are often unaware of the patient's true activity level, as they usually see their patients in a hospital bed rather than performing activities. SLEH developed a modified version of the six-minute walk test to determine if patients had oxygen desaturation episodes while performing activities of daily living such as walking around their home or taking a shower. SLEH calls this test the 60-second walk test. Basically, the patient is placed on room air and monitored while walking in his hospital room or in the hall, with pre- and post-pulse oximetry. Although this test is not clinically validated, it does provide the pulmonologist with information on the patient's minimal exercise tolerance. This objective clinical data has been an essential component to help physicians determine the need for home oxygen therapy.[4]

Ending the tug of war

It is prudent to note that reductions in LOS must not result in reduced quality. Health care organizations must maintain or even improve quality or their efforts will fail miserably, and patients will be dissatisfied and improperly cared for. As mentioned previously, COPD may be targeted for future reimbursement denials, and that will impact the bottom line for hospitals with excessively high readmissions. Also, exclusion of quality measures may be reflected in HCAHPS, a national patient satisfaction tool that will also affect future reimbursement.[5]

The tug of war between physicians, hospitals, and patients brings to light the need to provide safe, high-quality patient care in all patient care environments, especially as the patient leaves the hospital environment. Patients must be able to manage their disease at home. As hospitals attempt to minimize costs by reducing LOS, they need to understand the safety concerns of physicians and patients. Physicians want to ensure their patients will be safe in their home and may not discharge patients until they are assured patients can manage outside the hospital. COPD patients, especially those with comorbidities, may feel safer in the hospital environment as they have caregivers available on a 24-hour basis. This is not necessarily true in the home, making a home environment assessment an essential process component.

The Agency for Healthcare Research and Quality has clinical practice guidelines that might be useful for practitioners. These include:

- Global Strategy for the Diagnosis, Management, and Prevention of COPD[6]
- Diagnosis and Management of Stable COPD[7]
- COPD: Diagnosis and Management of Acute Exacerbations.[8]

These guidelines can be found at www.guidelines.gov, which is an excellent resource for this topic. ■

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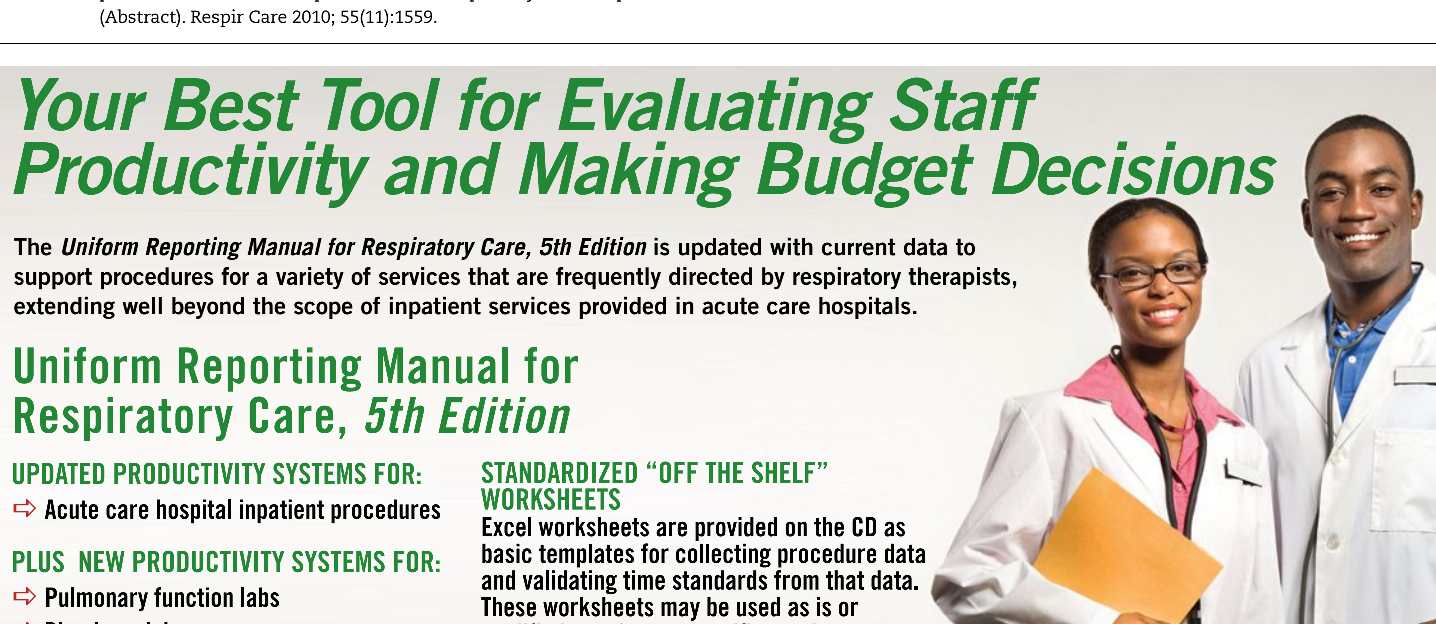

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Helping Patients with Pulmonary Disease Overcome Outdoor Barriers

by Karen L. Gregory, DNP, RRT, FAARC

A prescription for good health should include enjoyment of the great outdoors. Studies reveal physical and mental health benefits are achieved from having regular contact with the outdoor environment. Increased levels of vitamin D are achieved with outdoor exposure, which may protect against bone loss, heart disease, diabetes, and other health issues, including asthma.

Despite these health benefits, people with pulmonary disease encounter several barriers by going outdoors. Respiratory distress, progressive dyspnea, fatigue, and limitations of activity impact the quality of life in patients with chronic illness[1] and are found to be more challenging outdoors. Patients with pulmonary disease often report they are too fatigued for even mild exertion and refuse to go outdoors. Giving lung disease patients the knowledge and skill to overcome barriers of the outdoors may improve quality of life and help achieve control of the chronic illness.

Characteristics of pulmonary disease

Chronic obstructive pulmonary disease is estimated to affect 32 million persons in the United States and is the third leading cause of death.[2] Exacerbations of COPD are estimated to result in approximately 110,000 deaths and more than 500,000 hospital admissions per year, with over $18 billion spent in direct costs annually.[3]

Asthma affects approximately 22 million Americans, including more than 6 million children.[4] Approximately 500,000 annual hospital admissions are attributed to asthma, and an estimated 1.81 million people with asthma annually require treatment in an emergency department.[5] Medical expenses associated with asthma increased from $48.6 billion in 2002 to $50.1 billion in 2007.[6] COPD and asthma represent a substantial economic and social burden throughout the world.

Asthma and COPD are chronic inflammatory diseases that involve the large and small airways and cause airflow limitation and result from gene-environment interactions.[7] According to the National Asthma Education and Prevention Program and the Global Initiative for Asthma, asthma is characterized by variable and recurring symptoms, bronchial hyperresponsiveness, and underlying inflammation of the airways.[4,8]

The Global Initiative for Chronic Lung Disease (GOLD) describes COPD as a "preventable and treatable disease with some significant extra-pulmonary effects that may contribute to severity in individual patients.[9] Pulmonary components are characterized by airflow limitation that is not fully reversible and is usually progressive and associated with abnormal inflammatory response of the lung to noxious particles or gasses."[9]

Dyspnea and exercise intolerance are the two most common complaints from COPD patients.[9] Activities of daily living and exercise can result in devastating exacerbations, especially with uncontrolled lung disease. As patients with pulmonary disease become more sedentary secondary to fear of exacerbating symptoms, tolerance for outdoor activities decreases. Exercise intolerance in patients with COPD results from complex interaction between symptoms, impairment to ventilatory and respiratory mechanics, gas exchange limitations, and peripheral muscle fatigue.[1] Giving lung disease patients the knowledge and skill to overcome many burdens of the disease, including outdoor excursions, may significantly improve quality of life.

Importance of outdoor exposure for lung disease patients

It is clearly evident that the environment affects human health. The literature has suggested that the outdoor environment may have intrinsic qualities that enhance health and well being. Ulrich proposed that nature may allow psychophysiological stress recovery through innate, adaptive response to attributes of natural environments, such as spatial openness.[10]

Understanding the role of outdoor allergens and barriers for patients with pulmonary disease equips health care professionals to guide patients to overcome challenges. Jacobs describes in a longitudinal study of independent ambulatory community dwelling, older people have shown that leaving the home daily independently predicts the preservation of function and good self-rated health.[11]

Outdoor barriers: allergens

Allergies trigger asthma exacerbations in 60–90% of children and in 50% of adults. Approximately 75–85% of patients with asthma have positive results to allergy skin testing.[12] Airborne allergens in the outdoor environment are associated primarily with pollen grains and mold spores. Exposures are based upon geographic location, season, and weather conditions, Outdoor allergens are an important part of the exposures that lead to allergic disease.

Pollen and fungal spore exposures play a contributing factor in acute exacerbations of asthma. Pollen allergens are also commonly considered to play a role in allergic rhinitis, which is a well-known comorbidity of asthma. The evidence is increasing for a relationship between exposure to pollen, fungal, and other airborne allergens and exacerbation of asthma.[13]

Allergens are carried by a range of particles of different shapes and sizes. Airborne bioparticles containing allergenic proteins from wind-pollinated plants, fungi, animal dander, insect emanations, and other biologic

materials can cause sensitization and provocation of symptoms in atopic persons. The size of particulate matter in the air ranges from approximately 0.005 to 100 micrometers.[14] Particles less than 5–7 microns in diameter can reach terminal bronchioles, whereas larger particles become trapped in the upper airway.

In temperate regions, pollen producers are traditionally grouped as trees, grasses, and weeds. Trees are the earliest pollen producers in the United States, releasing their pollen as early as January in the southern states and as late as May or June in the northern states. In some areas of the United States, tree pollen seasons may begin as early as December or January, caused by pollen of cedar trees. Of the 50,000 different kinds of trees in the United States, less than 100 have been shown to cause allergies.[15]

The wide distribution of wind-pollinated grasses contributes to grass pollen sensitivity being a common cause of allergic disease. Grass pollens differ from ragweed pollen in their allergenic and antigenic properties and offer additional immunologic perspectives because of their extensive cross-reactivity.[16] Grasses typically release pollen grains in the afternoon. Weed pollination typically occurs in the last of summer through October in most regions of North America. Ragweed genus is flowering plants from the sunflower family and is considered the most important cause of allergenic rhinitis and pollen asthma in North America. Ragweed are annual or perennial herbs with lobed or divided leaves ranging from small plants 30 cm to 1.5 m in height to giant ragweed, which can reach 4–5 m tall. Ragweed pollen release normally occurs in midmorning as dew dries and humidity decreases.

Outdoor barriers: mold

Approximately 10% of the U.S. population has IgE antibodies to common inhalant molds.[17] Most mold genera are distributed indoors and outdoors. Outdoor mold exposure is generally more relevant in terms of sensitization and disease expression. Common molds are *Alternaria*, *Aspergillus*, *Cladosporium*, and *Penicillium*. Asthma exacerbations can be contributed to airborne allergens as demonstrated by an epidemic of asthma associated with high levels of *Alternaria*. Outdoor fungal particle levels usually peak seasonally, particularly in the mid-summer in temperate regions. Fungal spore exposure may increase in the spring, when snow uncovers decaying vegetation, and immediately following rainfall. *Alternaria* species are more prevalent in dry, warm climates and are usually dispersed by wind as dry spores.

Patients with allergy and pulmonary disease should be advised to stay indoors as much as possible during *peak* airborne allergy season. They also need to know that a high-performance allergy-free electrostatic air filter in the central air conditioning and heating system can be helpful for extracting pollen. Windows should be closed to prevent airborne pollen grains from entering the home or workplace. The window seals should be caulked and windows sealed to stop pollen and dust infiltration. Keep gardening or other outside clothing out of the home.

Bathing and washing hair in the evening before going to bed prevents exposure of pollen in the bedding. Patients should wear a pollen mask and gloves when working outside. Taking allergy medications as directed by the health care provider may be helpful before going outdoors for extended periods of time.

Patients with suspected pollen and mold allergy should be evaluated by an accepted method of allergy skin testing or in vitro quantitative assay to measure allergen-specific IgE for IgE antibodies as part of the clinical evaluation. Patient education and disease management is essential to achieve control of asthma exacerbated by allergy. Airborne allergy treatment, medication therapy including immunotherapy, and avoidance of airborne allergens is the key to achieving control of allergy symptoms.

Outdoor barriers: weather changes

Meteorological factors including humidity, barometric pressure, and sudden temperature changes may exacerbate asthma and COPD. High humidity frequently causes increased complaints of shortness of breath in patients with pulmonary disease. As humidity increases, the density of the air increases, creating more resistance to airflow in the airway, resulting in an increased work of breathing. Furthermore, the prevalence of airborne allergens may increase with increased humidity.

Outdoor barriers: air pollution

Air pollution is a well-recognized health hazard that affects people worldwide. Approximately 2 million premature deaths worldwide per year are contributed to air pollution.[18] While the progression between genetic and environmental factors in the development of allergic respiratory diseases remains a subject of investigation, it appears there is a link between the increase in the prevalence of allergic airway diseases and the increase in air pollution.[19] Epithelial cells contribute to the maintenance of an appropriate antioxidant environment in the airway wall. This is important because oxidizing agents, such as ozone, nitrogen oxide, and agents produced by inflammatory cells, are potent mediators of cell injury.[20]

Air pollution is associated with signs of asthma exacerbation, including increased bronchial hyperresponsiveness, visits to emergency departments, hospital admissions, and increased medication use. Ozone causes an immediate decrease in lung function and increased airway inflammation.[21] The inhaled oxidant gases, ozone, and nitrogen dioxide have been shown to increase non-specific airway hyperresponsiveness.[20]

Outdoor air pollution largely emerges from small particles and ground-level ozone from automobile exhaust fumes, smoke, chemicals from industrial units, dust, pollen, and mold spores. Ozone is the major constituent of photochemical smog that occurs in the troposphere, the lower portion of the atmosphere.

Ground-level ozone, the primary component of photochemical smog, is the most prevalent pollutant that has been known to cause a serious air pollution problem in many developed countries over the past few decades.[22] Ground level ozone is caused when the sun reacts with pollutants from cars and industrial plants to form ozone at or near the surface of the Earth. The ozone level can be a significant barrier to the outdoors for patients with pulmonary disease. The literature suggests that ozone increases asthma morbidity by enhancing airway inflammation.[23]

Ozone levels are worse on hot summer days, especially in the afternoons and early evenings. Patients with lung disease must be instructed to remain indoors during high-alert ozone days. The U.S. Environmental Protection Agency (EPA)[15] has estimated that 5–20% of the total U.S. population has a susceptibility to the harmful effects of ozone air pollution. The World Health Organization is working with every country in the world to reach new standards for air quality.

Respiratory therapists can positively impact patient care by educating pulmonary patients on safety strategies. Decreasing the susceptibility of patients with pulmonary disease by helping them control air pollution exposures is an integral component of clinical asthma management. RTs must promote policymaking and standards for air quality and advocate effective air pollution policies to protect patients with lung disease.

Air Quality Index

The Air Quality Index (AQI) scale is an index used for reporting daily air quality. The EPA utilizes the AQI for five major air pollutants regulated by the Clean Air Act, including ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, the EPA has established national air quality standards to protect against harmful health effects.[15] Figure 1 depicts the range, category, and color indications of the AQI.

Figure 1. Air Quality Index (AQI) Scale

AQI Range	AQI Category	AQI Colors
0 – 50	Good	(green)
51 – 100	Moderate	(yellow)
101 – 150	Unhealthy for Sensitive Groups	(orange)
151 – 200	Unhealthy	(red)
201 – 300	Very Unhealthy	(purple)

Exercising outdoors

Regular exercise can improve a patient's physical endurance and mental health. Although exercise does not improve lung function, muscular strength training can improve endurance and reduce breathlessness. Patients with COPD generally have a slow, insidious decline in exercise ability.

Outdoor exercising may further pose an increased risk of exacerbation and lower respiratory symptoms due to environmental triggers. Patients often eliminate outdoor excursions because of increased breathing effort and viewing them as unbeneficial for daily life. Modification of activities of daily living due to intensity of symptoms and tolerance levels often impacts their leisure activities. The RT can help their patients implement methods to overcome these barriers and improve their quality of life.

Asthma and COPD exacerbations can worsen with outdoor exposure if the medical treatment regimen and patient education program are not appropriately constructed or implemented. Exercise-induced bronchospasm (EIB) is a common complication of many patients with asthma. EIB is initiated by the process of respiratory heat exchange that results in the fall in airway temperature during rapid breathing, followed by rapid reheating with lowered ventilation.

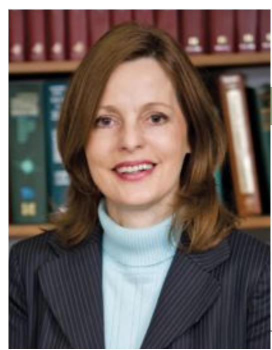
Respiratory therapists can advise these patients to take some precautions before exercising outdoors. Observing ozone and weather conditions is very important. Administering a beta-2 agonist medication 10–15 minutes before exercise or sports is recommended to prevent EIB. Taking 10–15 minute warm-up and cool-down periods can help reduce complications of EIB. Also, when exercising in cold air, breathing through a scarf or through the nose helps warm up the airways.

Keeping your patient healthy

Improved functional status has been linked with social activity and correlates with reduced levels of disability.[24] A strategic approach is to educate patients with lung disease about patient outcomes, lifestyles, complications of allergens, and barriers to the outdoors.

Clinical management of patients with lung disease must include the appropriate medication regimens to achieve and maintain control, as well as interventions to promote quality of life. Patient education is a vital component and must include teaching adverse effects through avoidance of outdoor exertions during pollution advisories and adverse weather conditions. Rapid assessment, monitoring, and appropriate response to worsening respiratory symptoms are essential skills for patients with pulmonary disease.

Respiratory therapists play a vital role in helping pulmonary disease patients overcome barriers that impede quality of life and avert successful outcomes. Implementing the appropriate patient education and medical treatment regimen will most often promote many opportunities for patients with pulmonary disease to enjoy the benefits of the great outdoors. ■



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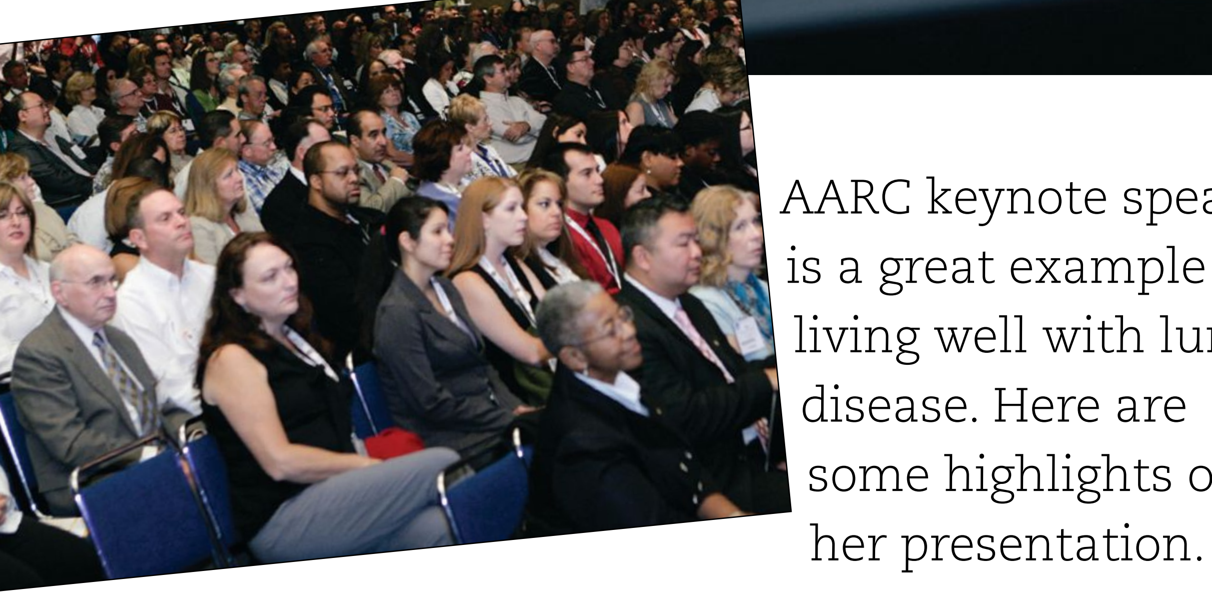
How We Can Help the "Impatient Patient"

by Debbie Bunch

Keynote Speaker Grace Anne Dorney Koppel shares her personal journey with COPD at AARC Congress 2011



AARC keynote speaker is a great example of living well with lung disease. Here are some highlights of her presentation.

Grace Anne Dorney Koppel said her pulmonologist likes to call her his “impatient patient,” and the keynote speaker at the AARC’s 57th International Respiratory Convention & Exhibition certainly is a fitting presenter for an audience of respiratory therapists. Diagnosed with COPD in 2001 and given only another few years to live, she has spent the last 10 years defying that diagnosis, not just for herself but for others through her work with the National Heart, Lung, and Blood Institute’s “Learn More, Breathe Better” campaign and throughout the halls of the U.S. Congress.

The Maryland attorney and business manager for her husband, former long-time *Nightline* anchor Ted Koppel, has also crossed paths with many respiratory therapists along the way, beginning with the RTs who helped her recover during her time in pulmonary rehabilitation. “I am here because we who have COPD owe you, respiratory therapists, our medical professionals who make significant differences in our lives,” she told the crowd gathered for opening ceremonies of Congress 2011. “You provide education, you provide comfort, and you empower us to be more than we thought we could be.”

See a video

on YourLungHealth.org or on *AARC Times* Online of the Keynote Presentation delivered by Grace Anne Dorney Koppel at AARC Congress 2011 in Tampa, FL.

Log on to aarc.org and see more photos and stories

Touring the exhibit hall

How the journey began

Dorney Koppel said she had a history of smoking when she went to her family doctor back in August of 2001, complaining of respiratory problems. But by the time those symptoms began, it had been 10 years since she had smoked and she had no idea what might be causing her to be so short of breath that walking even a few steps was a challenge. The physician didn’t connect the dots either. “Despite my recitations of classic symptoms of COPD to my family doctor, I was not tested by spirometry nor was I referred to another physician for spirometry,” she said.

The next few weeks were spent on a quest to find out what was wrong. “I was in a wheelchair as I went from medical appointment to medical appointment seeking a diagnosis for shortness of breath, wheeze, fatigue, and cough,” she said. The “impatient patient” inside of her wanted an answer, and shortly after the nation was stunned by the 9/11 terror attacks, she got it. “On Sept. 25, 2001, I was diagnosed with Stage 4, very severe COPD, and with Stage 1 ischemic heart disease,” she said. “My FEV_1 was 0.6 liters per second. I tested at 26% of predicted.” The physician told her she would most likely live only another three to five years and advised her to go home and begin making her end-of-life preparations.

Getting her life back

But she didn't stop there — she enrolled in a pulmonary rehabilitation program. "I began pulmonary rehabilitation within a month of my diagnosis in 2001; and that, more than any other available treatment, gave me my life back," she told her audience at the Congress. "You, respiratory therapists," she continued, pointing toward the crowd, "taught me how to live with COPD. Respiratory therapists did that for me."

The lessons she learned in pulmonary rehab have now become a mainstay in her life. She does 45 minutes to an hour on the treadmill every day of the week, and she also works out with free weights and does breathing and flexibility exercises. She makes sure she takes her medications as prescribed, gets the flu shot every year, and has been vaccinated against pneumonia. Despite a bout with lung cancer (she had a surgical resection of the upper lobe of her right lung six years ago) and other hospitalizations for pneumothorax, spine fracture, and respiratory infection, she still works more than full time and travels many months throughout the year.

"I have made major lifestyle changes, do adhere to medication schedules, and with the support of my good doctors, family, and friends, I have managed to keep my COPD stable," she reported. She has had no new hospitalizations in the last four years and now has no evidence of heart disease either. She noted that her current COPD status is GOLD Stage 3.

Dikes of courage

The road to these personal health accomplishments hasn't always been easy. "I do know and I dread exacerbations, breathlessness, air hunger," she told attendees. "The fear of air hunger haunts me more than the deepest pain I have ever known, although at times I have lived with very profound pain." She acknowledged the fact that respiratory therapists are no strangers to air hunger — they know well its signs and symptoms — but noted that it is one thing to recognize the condition in others and a very different thing to experience it for yourself. "Gulping for air while coughing violently and hearing the dissonant symphony of our own airways — I have been in that place," she said. "This is still the stuff of my nightmares."

She encouraged therapists to use every educational tool they have to ensure their patients understand what is happening when air hunger strikes — and most importantly, how to cope with it. "It is worse to experience air hunger without knowing what you have or what you can do about it. This is an area in which you educate your patients, since it will happen to them again and again," she said. "You are the builders of dikes of courage to hold back the floods of fear. When you teach us breathing techniques, you do this for us."

She also urged the respiratory therapists in the audience to make sure their COPD patients understand that pulmonary rehabilitation isn't a cure for their condition but the beginning of what must be a life-long commitment to better lung health. "Graduating from a pulmonary rehab program is a *first step* for COPD patients; it is not an end point," she said. "Please let your patients know that they hold many of the keys to continue controlling their disease." While medical professionals can educate their patients on the need for exercise, proper nutrition, and proper medication use, she emphasized that putting those lessons into practice is up to the individual patient. "There is not a magic pill for COPD."

Hope on the horizon

The keynote speaker said she's been fortunate that her disease has a reversible component that has allowed her to have a remarkably good response to bronchodilators, but she believes many COPD patients can gain ground as well. "Some doctors… still tell patients who are diagnosed with COPD that they have an irreversible disease," she said. "I think that the Global Initiative for Chronic Obstructive Lung Disease, or GOLD statement, says it much better." According to GOLD, "COPD is a preventable and treatable lung disease characterized by airflow limitation that is not fully reversible." She believes that "not fully reversible" part is just another way of saying the condition can be partially reversed, and research is now proving that. Unfortunately, a standardized procedure for interpreting reversibility has yet to be developed, which has led to confusion over the matter in medical circles.

Thankfully, more research is on the way. She noted progress is being made in the National Institutes of Health's COPD gene study launched in 2008, and another study is underway to advance understanding of the underlying mechanism of COPD. That study has identified a group of "frequent exacerbaters" across all disease stages, from mild to severe. Researchers believe an understanding of why these patients are more likely to suffer an exacerbation will help scientists develop better treatment plans for them.

A study conducted recently by Johns Hopkins has caught her eye as well. In that investigation, researchers identified an ingredient found in broccoli that opens up a key pathway (NRf2) that mediates the uptake of bacteria in the lungs. Researchers believe that use of sulforaphane (a broccoli ingredient) could one day lead to more effective use of corticosteroids in COPD patients who do not respond well to inhaled steroids the way that asthma patients do. This could halt the progression of COPD and increase survival.

The Centers for Disease Control and Prevention is also currently preparing the first National Action Plan for

COPD, and the U.S. Food and Drug Administration has agreed to accept a range of outcomes for clinical trials of COPD treatments. All this is good news, she said, and is in large part due to the increased advocacy over the past decade by numerous professional and patient advocacy groups.

Paying it forward

Grace Anne Dorney Koppel has learned a lot about COPD over the past 10 years, and her willingness to use her newfound knowledge to help others with the condition has gone a long way to moving that advocacy forward. Through her work with "Learn More, Breathe Better," she has brought the COPD message to the general public, and she also teamed up with organizations in the U.S. COPD Coalition, including the AARC, to successfully advocate for the pulmonary rehabilitation legislation that was signed into law a couple of years ago.

She said she is a big supporter of the AARC's Medicare Respiratory Therapy Initiative, as well. The legislation, currently pending in Congress as H.R. 941, would make it easier for respiratory therapists to be employed in sites outside of the acute care hospital. "You care for us in your hospitals; and if our legislative agenda is successful, we will soon see you in our doctor's offices under their general supervision," she told her audience. "And hopefully you will also assist us with oxygen and therapy in our own homes."

The Koppels have taken their commitment to COPD awareness beyond simple words of support. A few years ago on her birthday, her husband Ted surprised her with a generous donation from the family's foundation to support the development of a state-of-the-art cardiac and pulmonary rehabilitation center at St. Mary's Hospital in the underserved community of Leonardtown, MD. It's a project that remains near and dear to their hearts. "My husband and I resolved to use our family foundation to provide underserved communities with seed money to buy equipment and establish pulmonary rehab centers that meet CMS guidelines for reimbursement by Medicare, Medicaid, and private insurance companies," she said. "These clinics will bring smaller communities where COPD patients have no access to pulmonary rehabilitation the same quality of care that they would receive in the finest urban clinics in our land."

Moving forward with strength

When it comes time to note the cause of death on her death certificate, she said she is fairly certain her physician will enter the four-letter acronym for the disease that has defined her life over the past decade. But thanks to pulmonary rehabilitation, her medications, and perhaps most importantly, her own resolve to meet that condition head on, she doesn't foresee that day coming anytime soon.

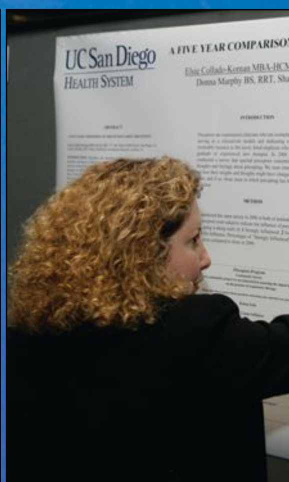
"The disease I had not wanted gradually changed me and became less of a handicap than an opportunity — a challenge — to make others with COPD who have not been identified get spirometry testing and earlier treatment." She ended her keynote address by thanking the AARC and its members for being there not only for her, but also for everyone who has received the diagnosis no one wants to hear. She closed her presentation with one of her favorite quotations from Ernest Hemingway. "In 'A Farewell to Arms,' he says, 'The world breaks everyone, and afterward, many are strong in the broken places.' Thank you, AARC, for making us who have lung disease stronger in our broken places." ■

The Stars W

Evidence-based science, and need-to-know information AARC Cong

Respiratory professionals from across the country and around the world converged on Tampa, FL, in early November for what promised to be four days filled with the latest in respiratory care — and they weren't disappointed. AARC Congress 2011 delivered in terms of evidence-based science. It delivered in terms of original research — and it delivered in terms of need-to-know information about changes coming down the pike from the Affordable Care Act and other initiatives with the potential to impact the way respiratory therapists provide care.

Along the way, attendees had a chance to honor top performers in the profession, visit the largest respiratory care exhibit hall in the industry, network with colleagues, and take part in social events tailored to them.

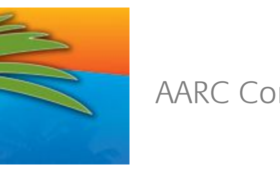


...ere out in Tampa!

...original research, ...took center stage at ...ress 2011

"This year's Congress reflects the growing influence our profession is having on the national and international stage," says AARC President Karen Stewart, MSc, RRT, FAARC. "Hospitals and other organizations continue to send their key staff members to this meeting because they know they'll come home with opportunities in which they can enhance the value of RTs and how they can play a more integral role in ensuring quality care while holding the line on costs."

On the following pages, you'll find complete coverage of the AARC's 57th International Respiratory Convention & Exhibition, the respiratory care educational meeting of the year! ■



Honoring Top Performers

The AARC, American Respiratory Care Foundation, National Board for Respiratory Care, and Commission on Accreditation for Respiratory Care presented a range of awards at AARC Congress 2011. Take a look at the awardees in this picture essay of our top performers in respiratory care this year.

Richard Branson

Katie Sabato

Brian Wilson

Log on to aarc.org and see more photos and stories.

Awardees Listing 2011

- Jimmy A. Young Medal: Richard Branson, MSc, RRT, FAARC
- NBRC/AMP William W. Burgin Jr. MD Education Recognition Award: Christin Nott, RRT
- NBRC/AMP Robert M. Lawrence MD Education Recognition Award: Donovan Peace
- William F. Miller MD Postgraduate Education Recognition Award: Carl Hinkson, BS, RRT
- NBRC/AMP Gareth B. Gish MS RRT Memorial Postgraduate Education Recognition Award: Daniel D. Rowley, RRT-NPS, RPFT, FAARC
- Charles W. Serby COPD Research Fellowship: Gary Brown, RRT
- Monaghan/Trudell Fellowship for Aerosol Technique Development: Maher Mubarak AlQuaimi, RRT

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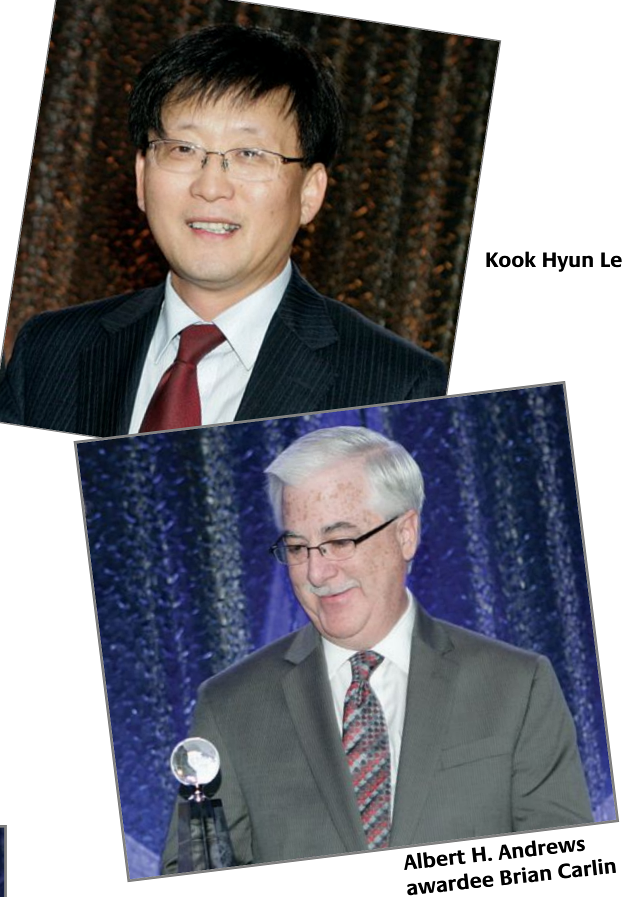

Kook Hyun Lee

Albert H. Andrews awardee Brian Carlin

Leann Papp

Specialty Practitioners of the Year:

Adult Acute Care, Carl R. Hinkson, BS, RRT; Continuing Care and Rehabilitation, Nita Cadic, BA, RRT; Diagnostics, Rick Weaver, RRT-NPS, RPFT; Education, Teresa A. Volsko, MHHS, RRT, FAARC; Long-Term Care, Alex Saint Amand, MBA, RRT; Management, Cheryl Hoerr, MBA, RRT, FAARC; Neonatal-Pediatric, Matthew McNally, BS, RRT; Sleep, Mark Eley, RRT-NPS, RPFT, RPSGT; Surface and Air Transport, Wade J. Scoles, RRT-NPS

President Stewart Outlines AARC Goals for 2012

AARC President Karen J. Stewart, MSc, RRT, FAARC, outlined her goals for this year in a presentation during the Annual Business Meeting. Here is what she plans to focus on for the remainder of her two-year term in office:

1. Continue to promote patient/family needs by being the advocate for those patients with respiratory disorders.

2. Continue to develop and execute strategies that will increase membership and participation in the AARC both nationally and internationally.

3. Promote patient access to respiratory therapists as medically necessary in all care settings through appropriate vehicles at local, regional, and national venues.

4. Continue to advance our international respiratory community presence through activities designed to address issues affecting educational, medical, and professional trends in the global respiratory care community and to advance advocacy for the patient.

5. Evaluate the transitional needs to meet the competencies necessary to develop the "Respiratory Therapist for 2015 and Beyond" based on the expected needs of respiratory care patients, the profession, and the evolving health care system.

6. Promote the access of high-quality continuing education to develop and enhance the skill base of current respiratory therapists to meet the future.

7. Maintain and expand relevant communication and alliances with key allies and organizations within our communities of interest.

8. Expand efforts to obtain research funding.

9. Increase and enhance activities to increase public awareness of respiratory therapists and their role in the treatment of respiratory disorders. ■

AARC President Karen J. Stewart and Patricia A. Doorley

Awardees Listing 2011 (cont.)

■ Philips Respironics Fellowship in Non-Invasive Respiratory Care: David N. Crotwell, RRT-NPS
■ Philips Respironics Fellowship in Mechanical Ventilation: Thomas Blakeman, MSc, RRT
■ CareFusion Fellowship for Neonatal and Pediatric Therapists: David Thelander, RRT-NPS

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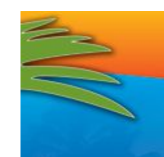

Honoring Top Performers

David Thelander, Maher Mubarak AlQuaimi, Thomas Blakeman, David Crotwell, and Gary Brown

Find more photos and stories by logging on to www.aarc.org

■ Zenith Award Winners: Covidien, Dräger, Philips Respironics, Masimo, and CareFusion

Florida Society won the Summit Award

■ AARC Zenith Award Recognizes Companies That Go Above and Beyond

Every year at the Congress, the AARC recognizes five companies for their quality, accessibility, responsiveness, service, truth in advertising, and support of the respiratory care profession.

The AARC's 2011 Zenith Awards went to Covidien, Dräger, Philips Respironics, Masimo, and CareFusion. Company representatives accepted the awards during Saturday's opening ceremonies, and many of them went on to display the award in their Exhibit Hall booths.

Honoring Those Who Serve

The Awards Ceremony held on Saturday morning to kick off the Congress included a moving tribute to our active-duty military attendees and veterans of service. But the AARC went much further than that in honoring our men and women in uniform by offering free Congress registration to any active military health care worker who wanted to attend. ■

Awardees Listing 2011 (cont.)

- Forrest M. Bird Lifetime Scientific Achievement Award: Brian Carlin, MD, FAARC
- Dr. Charles H. Hudson Award for Cardiopulmonary Public Health: Congressman Mike Ross
- Thomas L. Petty MD Invacare Award for Excellence in Home Respiratory Care: Brian P. Wilson, RCP, EMT-I
- Ikaria Literary Award: Katie Sabato, MSc, RRT; Priscilla Ward, RRT; William Hawk, MD; Virginia Gildengorin, PhD; Jeanette M. Asselin, MSc, RRT
- Dr. Allen DeVilbiss Literary Award: Elliott C. Dasenbrook, MD, MHS; Dale M. Needham, MD, PhD; Roy G. Brower, MD; Eddy Fan, MD
- Albert H. Andrews Jr. MD Memorial Award (NBRC): Brian Carlin, MD, FAARC

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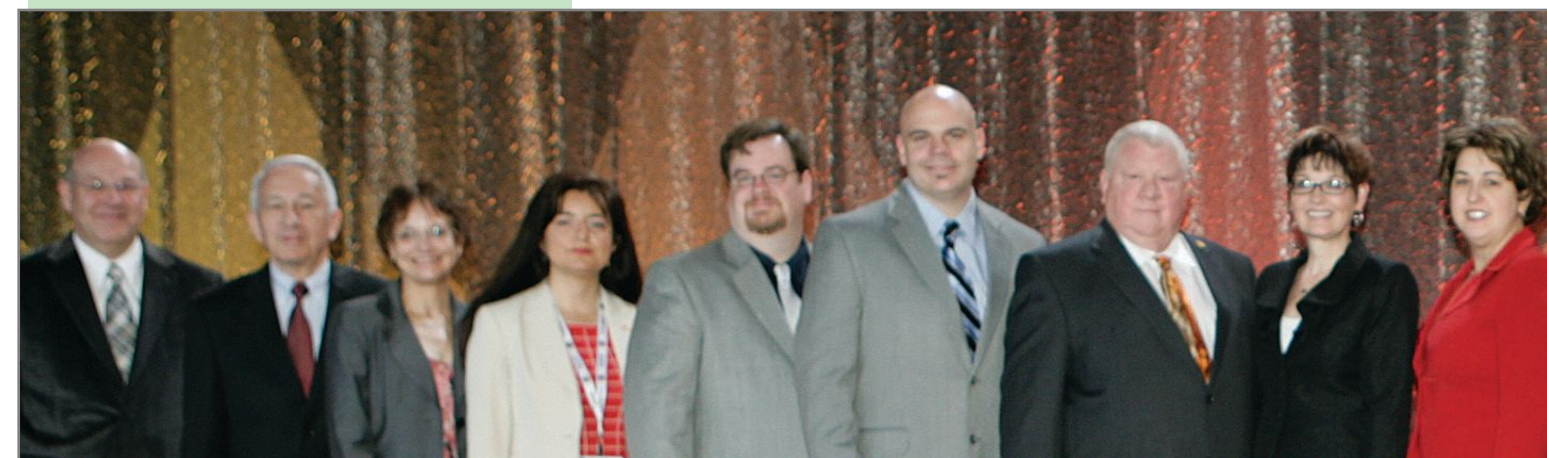


AARC Installs 2012 Officials ↑

The AARC installed its 2012 officials during the Annual Business Meeting on Sunday. Our new president-elect is George Gaebler, MSEd, RRT, FAARC. New Board members include Lynda Goodfellow, EdD, RRT, FAARC, and Doug McIntyre, MS, RRT, FAARC.

Three Specialty Sections also held elections this year, and these individuals were elected: Continuing Care/Rehabilitation, Gerilynn Connors, BS, RRT, FAARC; Long-Term Care, Lorraine Bertuola, BA, RRT; and Surface & Air Transport, Billy Hutchison, BA, RRT-NPS.

New House of Delegates officers include Karen Schell, MHSc, RRT-NPS, RPFT, speaker; John Steinmetz, MBA, RRT, speaker-elect; Rick Weaver, RRT-NPS, RPFT, secretary; Ross Havens, MS, RRT, treasurer. Bill Lamb, BS, RRT, FAARC, is now the past speaker. ■

■ **AARC Fellows (FAARC)**: Natalie Napolitano, MPH, RRT-NPS, AE-C; Erna L. Boone, DrPH, RRT; Felix Khusid, BS, RRT-NPS, RPFT; Arzu Ari, PhD, PT, RRT; Walter Furman Norris, Jr., RRT; Allen Wentworth, MEd, RRT; Raymond Meck, RRT, CRTT; Wesley M. Granger, PhD, RRT; Joseph Buhain, MBA, RRT, NREMTB; Glen N. Gee, RRT; Toni L. Rodriguez, EdD, RRT; Shawna Strickland, PhD, RRT-NPS, AE-C; Carl Hinkson, BSRT, RRT; Dave Crotwell, RRT-NPS; James W. Taylor, PhD, RRT; Robert Nicholas Kuhnley, RRT; Gary Lee Brown, BA, RRT; Lois A. Rowland, MS, RRT-NPS, RPFT; Suzanne Bollig, RRT, RPSGT; Karen L. Gregory, DNP, APRN-BC, RRT; William Stanley Holland, MS, RRT ↓

Honoring Top Performers

■ Education Recognition Awardees:

Christin Nott
Daniel D. Rowley
Carl Hinkson
Donovan Peace

Awardees Listing 2011

■ Dr. Ralph L. Kendall Outstanding Site Visitor Award (CoARC): Leann I. Papp, EdS, RRT, RN

■ Héctor León Garza MD Achievement Award for Excellence in International Respiratory Care: Kook Hyun Lee, MD, PhD

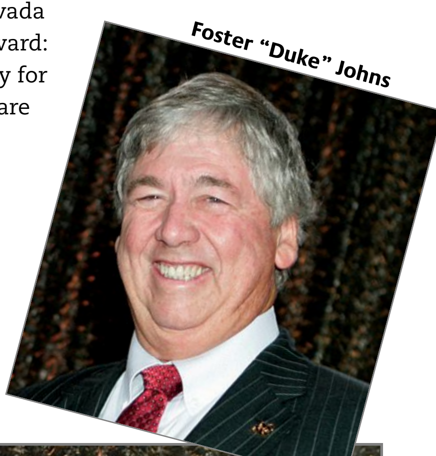
■ Honorary Membership: Foster M. "Duke" Johns III, BA

■ Life Membership: Patricia A. Doorley, MS, RRT, FAARC

■ Outstanding Affiliate Contributor: Meg Trumpp, MEd, RRT, AE-C, Kansas

■ Delegate of the Year: John Steinmetz, MBA, RRT, Nevada

■ Summit Award: Florida Society for Respiratory Care



Foster "Duke" Johns

■ International Fellows: Wang Sheng-yu, BS, MMed; Karel Roubik, MSEE, PhD; Edita Almonte, RRT-NPS, FAARC; Darko Kristovic, MD; Malak Shaheen, MD, FCCP

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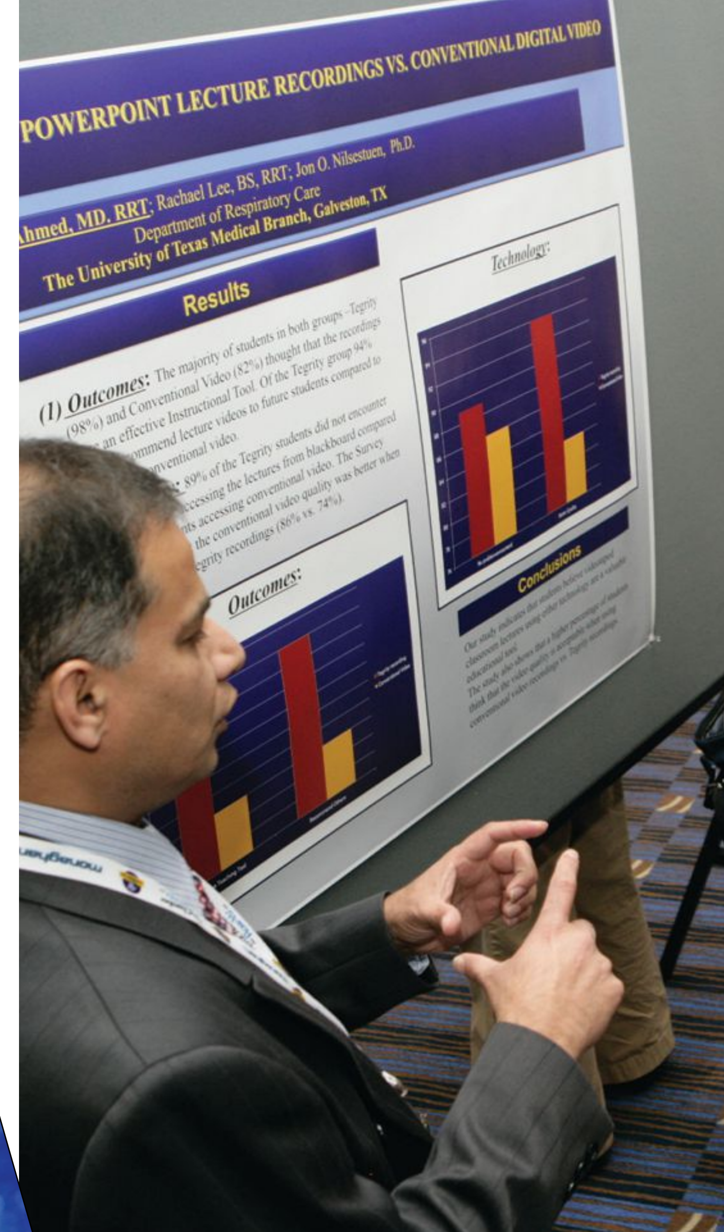


Getting Down to Business

Like any AARC Congress, our 2011 annual meeting was all about bringing respiratory care professionals up to speed on the scientific advances and C suite developments most likely to impact the care of patients in the coming year. Attendees in Tampa got all that and much more.

RESPIRATORY CARE Editor in Chief Dean Hess

Log on to aarc.org and see more photos and stories.

A Learning Experience Like No Other

With hundreds of presentations grouped together in symposia aimed at every sector of the profession, AARC Congress 2011 delivered take-home information from outstanding leaders:

- **Dean Hess**, PhD, RRT, FAARC, addressed the importance of positive end-expiratory pressure (PEEP) in lung protective ventilation, zeroing in on the evidence related to PEEP titration and approaches to selecting the level of PEEP that's right for individual patients.
- **Robert McCoy**, RRT, FAARC, looked at the variability between ambulatory long-term oxygen therapy systems, with an eye toward what hospitals need to know

about these systems in order to reduce readmissions for COPD patients.

- **John Davies**, MA, RRT, FAARC, reviewed the elements of an effective noninvasive ventilation (NIV) program, including an in-depth needs assessment, institutional buy-in, and the set-up of a group to oversee program requirements. He also explained how to determine the type and amount of NIV equipment needed and covered the development of therapist-driven protocols to help standardize NIV therapy.
- **Michelle Chatwin**, PhD, from London, United Kingdom, reviewed the indications and contraindications for NIV from physiologic disease states to specific patient characteristics. Attendees gained insight from this physician expert on the benefits and consequences of late-stage initiation due to extubation failure or end-of-life application.
- **Gene Gantt**, RRT, examined current projections on the number of patients undergoing prolonged mechanical ventilation and how the long-term care RT can alter cost trajectories for these patients through the use of innovative strategies.
- **Roger D. Seheult**, MD, tackled the problem of preventing ventilator-associated pneumonia (VAP) with an overview of emerging national patient safety initiatives. He made the argument that VAP prevention is a logical extension of lung-protective

(continued on page 56)

Something to Sleep on

Respiratory therapists have been helping contestants on NBC's ***The Biggest Loser®*** deal with their sleep apnea for the past six seasons. Congress attendees got the chance to find out what it's been like to work with these contestants from the RTs involved in a special symposium that also featured a previous trainer on the show and one of the former contestants.

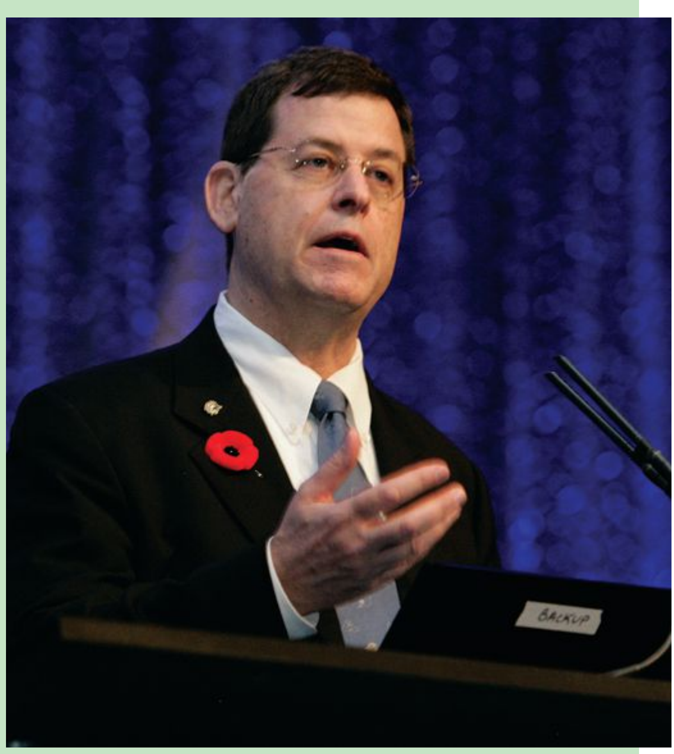
Season 11 trainer Brett Hoebel kicked things off with a talk about comorbidities associated with obstructive sleep apnea (OSA) and why diagnosis and treatment can make aggressive weight loss safer.

The session wrapped up with Season 9 ***The Biggest Loser*** contestant Ashley Johnston, who explained how education about OSA and treatment she and her fellow contestants received helped them reach their weight loss goals. ■

Choosing the Best Therapy for Our Patients

Medical science is full of failed treatments and modalities, many of which have persisted far past the point where science suggested they should be discarded. In this year's 27th Annual Phil Kittredge Lecture, Bruce K. Rubin, MD, MEngr, FAARC, chair of the department of pediatrics and professor of biomedical engineering at the Virginia Commonwealth University School of Medicine in Richmond, looked at "great mistakes" in respiratory care and what we can learn from them today.

"Logic, experience, and good old common sense have always helped us to choose the best therapy for our patients," noted the physician. "But logic and common sense can be harmful or deadly, even when backed up by generations of experience." He went on to share specific therapies used for years in respiratory care that have since been debunked by carefully conducted science and emphasized that more such studies are needed to ensure the treatments of today are worthy of tomorrow's patients as well. ■



Dr. Bruce Rubin

ventilatory strategies and, thus, an essential part of every RT's daily practice.

■ **Matthew O'Brien**, MS, RRT, RPFT, examined factors threatening hospital-based pulmonary function labs — including competition from physician practices that open and staff their own labs — and what hospital-based labs can do to maintain market share.

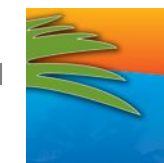
■ **James P. Shaffer**, MD, discussed indications for nocturnal positive airway pressure and the most common reasons for CPAP failure. He also covered the most recent advances in noninvasive ventilation that may increase adherence to this "gold standard" for treatment.

■ **Timothy Myers**, BSRT, RRT-NPS, related the evidence on liberation from mechanical ventilation and approaches to achieve that goal taken from different models of care.

■ **Julianne Perretta**, MSEd, RRT-NPS, explained how simulation training can ensure RTs are ready to provide care in low-volume, high-risk emergency situations.

■ **Douglas Masini**, EdD, RRT-NPS, FAARC, shared his experience with a project that used the iPad to provide onsite documentation of student competency, emphasizing the role this new technology can play in promoting trainee competency and improving patient safety.

■ **Carl Haas**, MLS, RRT, FAARC, covered ventilator discontinuation protocols and how these care delivery



tools can be used to their best advantage by respiratory care departments.

- **Debbie Koehl**, MS, RRT-NPS, AE-C, **Trina Limberg**, BS, RRT, FAARC, and **Gerilynn Connors**, BS, RRT, FAARC, provided a complete tutorial on how to set up a successful pulmonary rehabilitation program, complete with information on billing, staffing, program development, and program certification.
- **Brian K. Walsh**, MBA, RRT-NPS, FAARC, turned a critical eye on the tremendous influx of ventilation modes over the past few years, reviewing the medical evidence in the pediatric population and laying the groundwork for the use of individualized modes.
- **Bill Hutchison**, BA, RRT-NPS, shared the experiences of RTs who volunteered in the wake of the earthquake that hit Haiti a couple of years ago and how it took outside-the-box thinking to care for the victims. ■

20 — Yes, 20 — Open Forums!

The Open Forums have long been the home to original research at the AARC Congress, but the 2011 meeting went above and beyond with a record-breaking 20 symposia over the four days of the meeting.

Snapshots of the Open Forum posters at AARC Congress 2011

According to Respiratory Care Editor in Chief Dean Hess, PhD, RRT, FAARC, the extra sessions reflected the overwhelming number of scientific abstracts accepted for this year's Open Forums.

"The number of high-quality abstracts submitted for consideration has been growing for several years now, but last year we were literally inundated with top-notch submissions," says Dr. Hess. With so many abstracts worthy of acceptance, program planners raised the number of Forums, and that was good news for everyone in attendance.

"We believe the 20 Open Forums in Tampa raised the bar on how you practice in your own organizations and — we hope — raised some additional research questions as well that many of you will take back to those organizations and study over the course of the next year," says Dr. Hess. ■

Log on to aarc.org and see more photos and stories.

Reducing Readmissions Rules the Day

The Affordable Care Act's Hospital Readmissions Reduction Program has spurred growing concerns about re-hospitalizations in facilities across the U.S., and several presentations at the Congress focused on the issue:

■ Attendees who arrived a day early could participate in a day-long pre-Congress course designed to emphasize the need to involve all players in filling in all of the knowledge gaps, with presentations by leaders in the short-term acute care hospital, long-term acute care hospital, and home care. Sessions on the role the Centers for Medicare and Medicaid Services and BlueCross insurance will play in solving the problem were also included, as was a discussion on the physician's responsibility to promote a culture of seamless care.

■ Lectures continued during the regular program with presentations on the educational and financial aspects of the issue and proven strategies for addressing them utilizing the skills of the respiratory therapist. A two-part symposium on Monday and Tuesday took it from there, delving further into ways hospital and home care RTs can work together to reduce costly readmissions, drawing in part from a recent survey conducted by the Management and Home Care Sections through their "Hospital-to-Home" initiative to find out what hospitals are already doing in this area.

■ Pennsylvania members offered proof of concept for reducing readmissions in an Open Forum update on a program they started in 2010 to provide COPD home care patients with the education and information they need to successfully manage their disease at home. The RT-driven program effectively brought the readmission rate for enrolled patients to <5% — quite an accomplishment in an area of the country where the readmission rate for control groups was running about 25%. ■

Lessons Learned from

by Steve Sittig, RRT-NPS, C-NPT, FAARC

The 38th Donald F. Egan Scientific Memorial Lecture took aim at military mass casualty care with a review of the Air Force's Critical Care Air Transport Teams (CCATT), presented by Jay Johannigman, MD, who spoke on "Forged in the Fires of Battle: Advances in Medicine." Dr. Johannigman, who holds a Bronze Star for his work as deputy commander of the 332nd Expeditionary Medical Group in Iraq and played an integral role in the development of the CCATT concept, explained how these teams have evolved in terms of practice guidelines, standards of care, and clinical management.

"The CCATT team and the subsequent evolution of en-route care has had a dramatic impact on our capability of caring for the wounded casualty," said the professor and chief of the division of trauma and critical care at the University of Cincinnati in Ohio. "The challenge of today and the imperative for tomorrow is to ensure that care in the air is equivalent to care on the ground."

Made up of a physician, critical care nurse, and respiratory therapist, CCATTs are widely credited with saving the lives of many soldiers

With international attendees from more than 37 nations around the world, AARC Congress 2011 lived up to its reputation for bringing diverse professionals together for continuing education in respiratory care.

Presentations by Stefano Nava, MD, and Paolo Navalesi, MD, from Italy, and Michelle Chatwin, PhD, from the United Kingdom, educated attendees on approaches to invasive and noninvasive ventilation in their nations; and the international practice of respiratory care took center stage during Open Forums featuring respiratory care colleagues from Italy, Saudi Arabia, China, Taiwan, Brazil, India, the United Kingdom, the Czech Republic, Canada, Poland, and Estonia.

the Gobal War on Terror

who would otherwise have succumbed to their injuries. According to Dr. Johannigman, the goal is to provide seamless critical care from the far forward setting all the way to the continental United States, a mandate that presents constant challenges for the equipment, caregiver, and the aeromedical evacuation system.

Dr. Johannigman described the care being provided to our critically injured soldiers in the ongoing theaters of operation in Iraq and Afghanistan and guided the audience through the process of caring for one soldier injured in a round of sniper fire.

According to the physician, the RT is key in helping to care for these injured soldiers during transport to more definitive care. He also emphasized that lessons learned during the care of these soldiers have significantly changed practice guidelines, standards of care, and clinical management algorithms. What's more, these new methods of treatment are now moving into civilian trauma care. For example, long-held concepts of massive fluid resuscitation with crystalloid are now being revised in favor of using whole blood.

Dr. Johannigman said this advanced care is being delivered with technology that is approximately 20 years old and went on to describe the research that he is conducting along with Richard Branson, MSc, RRT, FAARC, CMSgt Dario Rodriquez, RRT, and others in Cincinnati in conjunction with the U.S. Air Force and Department of Defense.

He also described the use of autonomous controllers that can titrate the oxygen concentration supplied by a ventilator faster and more efficiently than a clinician, an important capability as oxygen supply is a critical issue in the long flights these teams do everyday. These autonomous controllers are now being looked at in such roles as fluid resuscitation and even pain control.

As trials of new technology progress, Dr. Johannigman pointed out value that RTs such as Branson and Rodriguez add to the process, noting that knowing how to take the technology to the next level has always been a forte of the respiratory therapist. ■

Egan Lecturer Dr. Johannigman and Karen Stewart

the Globe

We also had the great pleasure of welcoming another group of AARC international fellows to the meeting after their two-week stays in the United States to learn more about American-style respiratory care. 2011 international fellows included Wang Sheng-yu, BS, MMed, from China; Karel Roubik, MSEE, PhD, from the Czech Republic; Edita Almonte, RRT-NPS, FAARC, from the UAE; Darko Kristovic, MD, from Croatia; and Malak Shaheen, MD, FCCP, from Egypt.

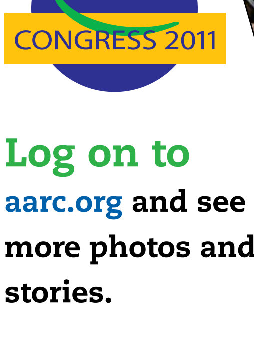
We also honored two outstanding members of the international respiratory community with top awards — the 2011 Héctor León Garza MD Achievement Award for Excellence in International Respiratory Care went to Kook Hyun Lee, MD, PhD, from South Korea, and the Koga Medal was presented to Patrick Dunne of Fullerton, CA.

The international aspects of the meeting culminated with an international reception held on Monday evening to raise funds for the American Respiratory Care Foundation. Those who attended the event networked with their colleagues from abroad and also helped the ARCF support projects and programs that will continue to build the bonds between respiratory professionals here and around the world. ■

Value-added Features Made This the

Best Educational Opportunity of the Year

People attend the AARC Congress for the continuing education they find in the main program and pre-Congress sessions. But there is always a lot more going on at the meeting than our official *Program* illustrates. 2011 delivered plenty of value-added features to enrich the overall Congress experience for attendees, whether they were first-timers or seasoned pros.

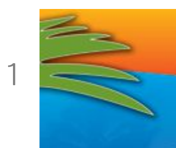


Log on to aarc.org and see more photos and stories.

AARC Exhibit Hall Offered the Latest in Equipment and More

With hundreds of exhibitors, including all of the major companies in the industry, the AARC Exhibit Hall provided everyone with the opportunity to see and touch the latest equipment in the profession. And thanks to our "Buying Show" concept, attendees also could negotiate pricing and purchase products right on site, usually at discounts well below what is offered to hospitals, even those participating in group purchasing organizations.

But demonstrations of the latest equipment and great deals weren't the only things going on in the Exhibit Hall. Several exhibitors also hosted breakfast symposia on hot topics of the day, and there were a number of vendor-supported continuing education programs as well, often designed to help educate attendees on the science behind their latest products and services. ■



Dr. Lewis Rubinson

Federal Recruiters Cite the Importance of Disaster Response Teams

Ensuring our nation is prepared in the event of a large-scale medical emergency is the goal of the federal government's National Disaster Medical System (NDMS) and Medical Reserve Corps (MRC), and both sent recruiters to the AARC Congress to educate respiratory therapists about the role they can play on various medical teams set up to respond.

The NDMS was specifically recruiting RTs for its Disaster Medical Assistance Teams and Mobile Acute Care Strike Teams (also known as the DMATs and MAC-STs). The MRC was looking for therapists to join these teams located throughout the country.

Attendees also had the opportunity to learn more about disaster response in symposia centered on "Disaster Responses: How Can the Respiratory Therapist Help?" and "Mass Casualty Respiratory Care." The first session included presentations on ventilators and air transport in mass casualty events. It also had a session on getting involved, delivered by NDMS Deputy Chief Medical Officer Lewis Rubinson, MD, PhD, FCCP. The second session addressed critical care, ethical decision making, and the role of the RT in disaster response. ■

You can purchase recordings of the lectures presented at AARC Congress 2011 through Sound Images Inc. at www.siattend.com/aarc/.

Volunteer Medical Reserve Corps Recruits RTs at Congress

The Medical Reserve Corps (MRC) had a booth in the AARC Exhibit Hall that educated attendees on the need to volunteer their expertise and time to their communities during a disaster or public health event. *AARC Times* talked with the MRC booth staff at the meeting; the interview follows.

Since you have a booth here in our Exhibit Hall, we understand you're looking for RTs to volunteer for the MRC. Have you gotten a lot of interest here in your booth?

We've gotten a wonderful response at this AARC conference! There's been a high level of interest and enthusiasm, and we definitely get the sense that RTs want to help people in their community.

We are looking for respiratory therapists to provide medical services, such as helping out in emergency shelters for disaster evacuees. People with chronic respiratory conditions such as asthma, COPD, and sleep apnea take their chronic conditions with them and may need specialized respiratory care while in the shelter. The more RTs who volunteer for the MRC, the better chance we have of being able to provide that care when needed.

We've also had some RTs stop by who are educators, and they're taking materials back to share at their colleges. Students can provide health education and non-medical assistance as MRC volunteers prior to their graduation, and then specialized care once they are licensed.

Also, MRC is always in need of volunteers to help with non-medical activities, such as supply and logistics managers, coordinators, drivers, and other support personnel. We're coming up on the MRC's 10th anniversary in 2012 and are looking forward to celebrating the contribution that the MRC has made to local communities.

How would RTs take the first step to volunteer for the Medical Reserve Corps?

To sign up, they can go to our website at www.medicalreservecorps.gov, click on "volunteer with MRC," and search for their area of the country on the map. There they will find contact information for their local MRC leader who will provide more information on how to become a volunteer. ■

Medical Reserve Corps Booth

AARC Show Booth

AARC Show Booth Promoted Member Connections

The AARC booth in the Exhibit Hall was the place for members to meet and greet Specialty Section chairs and find out more about what these groups have to offer. People who stopped by also were able to get up to speed on all the social media connections the AARC offers these days. Booth representatives were ready with short tutorials on Facebook and Twitter, and most importantly, through the AARC's own social networking site, AARConnect. ■

Vent 5K Winner Announced

For the past several years, the American Respiratory Care Foundation has been hosting a competition called the Ventilator 5K to help raise funds for local lung health issues. 2011 saw a number of these events around the country, and all of them were entered into a competition to pick the top Vent 5K of the year. The grand prize was awarded during the Congress, and top honors went to the group from Weber State University in Ogden, UT, who walked away with a certificate for a brand new ventilator donated by Breathe Technologies.

If you'd like to put your group in the running for the 2012 grand prize, just visit arcfoundation.org and click on "Vent 5K" to find out everything you need to know to host an award-winning Vent 5K event of your own this year. ■

Great American Screen Off Took Lung Health Messages to the Tampa Community

Snapshots of the Great American Screen Off at AARC Congress 2011

Tampa residents heard about lung health from the lung health experts the day before the Congress when the AARC hosted the 2nd Annual Great American Screen Off in the Tampa Marriot Waterside Hotel & Marina. The screen off is a DRIVE4COPD event designed to be a one-day wake-up call to inform people about the importance of early screening and detection of chronic obstructive pulmonary disease.

The AARC worked with the COPD Foundation, Florida Society for Respiratory Care, and Florida COPD Coalition to invite the local community; and local residents came out for spirometry tests and education on their respiratory conditions and aerosol medication delivery devices. RTs made sure that everyone attending was asked to take DRIVE4COPD's five-question population screener. The event also included a Tampa COPD Community Workshop designed especially for people living with this chronic lung condition. ■

Log on to aarc.org and see more photos and stories.

Snapshots of the AARC Congress 2011

AARC 2012 Corporate Partners

The Congress was a great place to introduce everyone to our new and returning AARC Corporate Partners for 2012: CareFusion, Masimo, Covidien, Monaghan, Philips Respironics, Dräger, GE Healthcare, Maquet, Kimberly-Clark, Tri-anim, and Teleflex. All of these companies comprise best-in-class organizations interested in supporting the goals and work of the Association. The program provides respiratory care providers with information, insights, and innovative approaches to improve performance and advance the health of their patients. ■

California won the Covidien Sputum Bowl

California won the Student Sputum Bowl
Winners ???????

Roche 5K Fun Run and Walk

All the AARC CRCE Credits You Need

AARC Congress 2011 offered 24.67 hours of Continuing Respiratory Care Education (CRCE) credit, and attendees had the chance to earn extra CRCEs during pre-sessions that took place the day before Congress and breakfast symposia and vendor-sponsored sessions sprinkled throughout the four days of the Congress. It all added up to more than enough credits to maintain your license to practice in any state. ■

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Snapshots of the AARC Congress 2011

The AARC Program Committee met on the last day of Congress 2011 to begin planning the 2012 Congress to be held in New Orleans. Committee Chair Cheryl Hoerr led the session and challenged committee members to offer ideas to make next year's AARC Congress the premiere meeting of the profession.

On to New Orleans for the Next AARC Congress!

Tampa was a great host for AARC Congress 2011, but now it's time to turn our attention to the AARC's 58th International Respiratory Convention & Exhibition, Nov. 10–13, 2012, in New Orleans, LA. You won't want to miss this great opportunity to learn the latest in respiratory care in a city that's rebounded big time since Hurricane Katrina in 2005.

So mark your calendars now for AARC Congress 2012 and join us in the "Big Easy" as we all come together again to educate ourselves on the best way to provide the high-quality respiratory care our patients deserve.

"The AARC officially invites everyone to join us next Nov. 10–13 as we once again gather for what promises to be another premiere meeting in the respiratory care profession," says 2012 Program Committee Chair Cheryl Hoerr, MBA, RRT, FAARC.

Louisiana Society for Respiratory Care President-elect Shantelle Graves, BS, RRT, says the state society is ready to roll out the welcome mat. "The Louisiana Society invites everyone back to experience a little Louisiana culture — guaranteed, true Cajun style … *laissez les bons temps rouler!*"

Want a sneak peek at what New Orleans will have to offer next November? Check out the city's official tourism site at www.neworleansonline.com to see one of our country's most culturally and historically rich destinations. ■

Plan Now for Your AARC Congress 2012 Attendance

If you've read through our AARC Congress 2011 coverage, you know this premiere meeting of the year in respiratory care has what it takes to bring respiratory care professionals up-to-date on all the latest developments in the field. Many hospitals are already budgeting for Fall 2012 meeting attendance this month, so if you'd like to be there Nov. 10–13 when we reconvene in New Orleans, LA, now is the time to start planning for your attendance. A great way to let your supervisors know why you want to be a part of AARC Congress 2012 is to simply provide them with a copy of this AARC Congress 2011 wrap up. When they see how much knowledge, science, original research, and other content was delivered in Tampa, they'll certainly want you to be front and center to take advantage of an equally packed program already in the works for New Orleans. ■

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Marketplace

Featuring information on products and equipment from manufacturers

Automatic Oxygen Controller

CareFusion's Closed Loop Controller of Inspired Oxygen system, or CLiO2™, is the first automatic oxygen controller of its kind designed to keep blood oxygen levels within a safe range for newborns needing mechanical ventilation. An enhancement to the CareFusion AVEA™ ventilator, the CLiO2 system noninvasively and continuously measures the oxygen level using Masimo SET® Measure-Through Motion and Low Perfusion pulse oximetry technology. The system processes blood oxygen saturation levels by a computer algorithm that then anticipates trends and modifies the amount of oxygen delivered. If necessary, adjustments can be made on a second-to-second basis. www.carefusion.com

Pediatric Compressor Nebulizer System

The Sami the Seal pediatric compressor nebulizer system from Philips Respironics incorporates a child-friendly design to help support aerosol compliance. The compressor is paired with the company's highly efficient SideStream nebulizers and Tucker the Turtle pediatric mask to provide fast and friendly treatment to pediatric patients in the home. Only 3.5 pounds, Sami is durable, easy to use, and easy to maintain. The Tucker the Turtle mask is made of soft, flexible material that contours to the face for comfort and fit. www.philips.com

Pulse Oximeter

Nonin Medical Inc.'s low power Xpod® Model 3012LP, OEM Pulse Oximeter consumes half the power of the company's first-generation Xpod and also features a low noise voltage regulator to reduce noise coming from the power supply and ensure high performance and accurate readings. The device interfaces with Nonin's PureLight® disposable and reusable sensors and offers multiple data formats to meet the varied needs of customers' OEM oximetry applications. Other enhancements include an expanded input voltage range, early compliance to new lead-free standards, an enhanced safety design that meets IP33 water ingress standards, and a high-resolution PPG pulse waveform. www.nonin.com

Closed Suction System

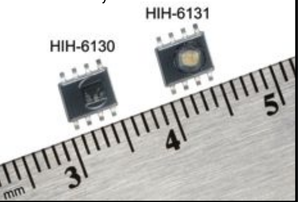
The KimVent Multi-Access Port (MAP) Closed Suction System from Kimberly-Clark Health Care features a compact rotating manifold with multi-access ports, allowing clinicians to perform suctioning and other procedures, such as bronchoalveolar lavage, bronchoscopy, or MDI drug delivery, while maintaining a closed ventilator circuit. Designed in collaboration with respiratory therapists, system addresses AARC best practices and also fulfills recommendations included in the VAP prevention bundle strategy. www.kchealthcare.com

Secure Connector

Aerolung Corp's Secure O_2® oxygen delivery products feature oxygen tubing with the built-in Secure O_2 connector. Secure O_2 provides the convenience of universal oxygen tubing without the risk of tubing disconnections and misconnections that can occur in the hospital. Simply screw the Secure O_2 connector to a hospital flow meter for a quick and reliable connection every time. Hospitals can stop buying and stop reusing dirty (nipple and nut) tree adapters. www.secureo2.com

Digital Humidity/Temperature Sensors

Honeywell's new HumidIcon™ Digital Humidity/Temperature Sensors offer accuracy, stability, and energy efficiency in a lowest total cost solution. Designed for use in RC, the sensors have an industry-leading Total Error Band that provides the sensor's true accuracy of ±5% RH over a compensated temperature range of 5°–50° C and 10%–90% RH plus effectively eliminates individual sensor testing and calibration, supports system accuracy and warranty requirements, helps to optimize system uptime, and provides excellent sensor interchangeability. www.honeywell.com



▶ Press releases and photos on new products are welcome. Send to Marsha Cathcart, *AARC Times* editor, at cathcart @aarc.org.

CALL FOR ENTRIES

AARC *Times*

PHOTO CONTEST

HERE'S YOUR CHANCE TO HELP CHOOSE THE COVER OF *AARC TIMES* MAGAZINE

HERE'S HOW IT WORKS:

AARC Times will collect photo entries from AARC Members. Contest finalists will receive one year of **FREE DUES** on renewal AND will automatically be entered into the publication's Photo-of-the-Year Contest, which will take place in the December 2012 issue.

The member chosen as the Photo-of-the-Year winner will see his or her photograph on the **COVER** of the February 2013 issue of *AARC Times*!

WHAT KINDS OF PHOTOS ARE WE LOOKING FOR?

Heartwarming photos of your adult patients who rely on your care and guidance and who inspire you.

JUST FOLLOW THESE SIMPLE RULES:

- Provide a signed release for any patients or co-workers pictured in your photos. Members can sign in to access the form at **www.aarc.org/members_area/aarc_times/photo_contest/index.asp** or it can be faxed to you by calling Karen Singleterry at (972) 406-4661. Photos cannot be published without signed releases.
- Send a brief background story with the photo.
- Photos will not be returned and become the property of the AARC.
- Do not print photos from your home printer.
- Photographic prints of good quality are acceptable. Please **read the requirements we have provided at left** so that you send your photo in a format that can be used and reproduced in a magazine.
- You must obtain permission from those photographed to enter the contest.

IMPORTANT: PLEASE READ THE FOLLOWING PHOTO REQUIREMENTS

Adhering to these requirements will assure that your photograph will be acceptable for publication. A good photograph produced at the wrong resolution may render it unsuitable for reproduction.

➡ **Since the photo is for the cover,** we require a vertical format. Turn your camera sideways to take the photo.

NO | YES

➡ **Most digital cameras give you a choice of settings for image resolution.** Photos taken at lower resolution settings take up less room on your memory card but may not be useable for print productions. Set your camera for the highest resolution photo and save it as JPEG or TIFF.

➡ **We prefer that you mail a CD of your photo since it will probably be too large to be emailed.** If you do try to email, please send it directly to our production manager, Donna Knauf, at knauf@aarc.org and indicate clearly in your email that the photo is for the Photo Contest.

WWW.AARC.ORG

Sleep Waves

(continued from page 7)

appliance in improving sleep-disordered breathing, and predicting who will respond to OA therapy remains difficult, OAs are effective in treating OSAS. With this in mind, it would be appropriate to recommend OA therapy for those patients who are unable or unwilling to tolerate PAP therapy. Oropharyngeal exercises reduce OSAS severity and may become a viable treatment alternative in mild-moderate OSAS in the future as well. However, the role of surgical interventions is not established in OSAS and is not indicated in a majority of the cases at this time. ■

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Vent for Life

(continued from page 10)

A promising future

More people are surviving critical illness and lengthy hospital stays. Prolonged immobilization and bed rest have been associated with many consequences, including deconditioning, neuromuscular dysfunction, and intense rehabilitation requirements. Although the evidence is somewhat limited, it is not unreasonable to hypothesize that early intervention and ambulation will lead to shorter hospital stays and fewer related complications. Future investigations should prove promising. ■

Be Our Guest!

If you provide respiratory care outside of the United States, and would like to share and expand your knowledge, please consider applying for our International Fellowship Program.

The **International Fellowship Program** is a sponsored activity of the American Association for Respiratory Care (AARC). Since 1990, health professionals from more than 50 countries have shared experiences, knowledge and developed lasting friendships through this exceptional program.

The three-week program takes each participant to two host cities in the United States and concludes with attendance and acknowledgement at the AARC's International Respiratory Convention & Exhibition.

Learn more and apply at: **www.aarc.org/resources/international_fellows/**

APPLICATIONS ACCEPTED JANUARY 1—JUNE 1

American Association for Respiratory Care
International Fellowship Program

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Government Advocacy

(continued from page 22)

AARC continuing our efforts

We anticipate the pace of state legislation and regulations impacting the profession of respiratory therapy in 2012 will mirror what has just occurred in 2011. In a year where little was done to pass legislation for new initiatives that added costs to the system, our job to pass the Medicare Respiratory Therapy Initiative was particularly challenging. We expect 2012 will be a continuation of our efforts to build support with members of Congress so that when a "must pass" health care bill becomes available, we will have enough support to attach our legislation to it. Federal quality initiatives that provide better coordinated care, improve health outcomes, and reduce costs will continue in 2012 and beyond. ■

EDITOR'S NOTE

Bonus information is available in the online version of *AARC Times* by clicking on the underscored links. AARC members can access the online version. Log on to www.AARC.org and select the *AARC Times* icon in the left margin.

RC Currents

IN THE NEWS

New Aerosol Book Targets the Interdisciplinary Team

Last year, the AARC published "A Patient's Guide to Aerosol Drug Delivery" to provide patients and families with step-by-step guidance on how to take their medications and care for their devices.

This year, we're following up with "A Guide to Aerosol Delivery Devices for Physicians, Nurses, Pharmacists, and Other Health Care Professionals" to help our colleagues in health care deliver accurate information on inhaled medications to their patients. Written by Deborah Elliott, MSN, NP-C, and Patrick Dunne, MEd, RRT, FAARC, the guide includes an executive summary and a "quick read" section designed to deliver the key points in a succinct fashion for busy physicians and other health care professionals.

"We're asking our members to help spread the word about this book's availability," says AARC President Karen Stewart, MSc, RRT, FAARC. She noted that you may want to make this link available to members of your health care team so that they have this ready guide to help them. The book can be downloaded at www.aarc.org/resources/aerosol_nonrts.pdf/. ■

Request for Lecture Proposals for AARC Congress 2012 — New Orleans

The AARC invites you to submit proposals for individual lectures or symposia at AARC Congress 2012 and also to submit abstracts from original studies for presentation during its Open Forum.

Individuals, groups, institutions, or companies may submit proposals with interest in the practice of cardiorespiratory care. This is your opportunity to present educational content to your peers. If you believe you're a content expert or possess unique knowledge in adult acute care, management, neonatal/pediatrics, home care, sleep, education, continuing care/long-term care, diagnostics, surface/air transport, or any other aspect of respiratory care, then this is your opportunity to showcase your knowledge on a national stage.

The deadline to submit proposals for lectures/symposia for presentation at AARC Congress 2012, Nov. 10–13, in New Orleans, LA, is Dec. 14 at http://aarc2012.abstractcentral.com/.

Considered by many to be the premier event at the AARC Congress, the Open Forum is your opportunity to gain national and international recognition for your research in cardiorespiratory care by submitting an original abstract for presentation at the Congress and having it published in Respiratory Care.

The deadline to submit abstracts for the Open Forum is June 1, 2012. ■

National Respiratory Care Week 2011

Read more about National Respiratory Care Week 2011 online at www.AARC.org/headlines/11/11/rc_week/.

Medical University of South Carolina, Charleston, SC

Brooke Army Medical Center, Ft. Sam Houston, TX

Respiratory Care Education Annual Call for Papers

The AARC will publish Volume 21 of the *Respiratory Care Education Annual* in the summer of 2012. This refereed journal is committed to providing a forum for research and theory in respiratory care education and is listed in the "Cumulative Index to Nursing and Allied Health Literature."

The AARC Education Section invites educators to submit papers for consideration. Preference will be given to papers that emphasize original research, applied research, or evaluation of an educational method. Other topics that may be considered include interpretive reviews of literature, educational case studies, and point-of-view essays. Submissions will be reviewed based on originality, significance and contribution, soundness of scholarship (design, instrumentation, data analysis), generalizability to the education community, and overall quality of the paper. Papers should be approximately 6–10 pages in length and **must** follow the guidelines in the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals," 5th edition (1997). These may be found at www.rcjournal.com/guidelines_for_authors/preparing_the_manuscript.cfm. Abstracts should not exceed 250 words. For more information, contact Dennis Wissing, PhD, RRT, FAARC, editor, at dwissi@lsuhsc.edu or (318) 573-9788. Electronic copies of completed manuscripts should be sent to Bill Dubbs at dubbs@aarc.org.

The deadline is Feb. 29, 2012. ■

RT Student Writers Needed

AARC Times is always looking for good stories from AARC student members that give the RT student perspective on the respiratory care profession they have chosen as a career.

If you have a story to tell, please send it to Marsha Cathcart at cathcart@aarc.org and include in the subject line, "Student Member Story." Be sure to give us your full name, AARC member number, a brief description of the story subject, and why you would like to have it published. We hope to hear from you soon! ■

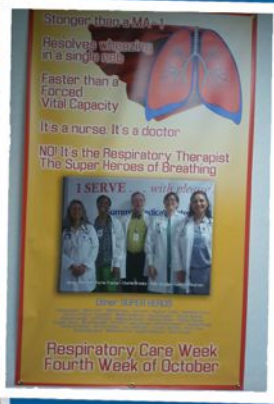
Education Section Calls for Abstracts for Santa Fe, NM, Summer Meetings

The 2012 AARC Summer Forum, scheduled for July 13–15 in Santa Fe, NM, offers an excellent opportunity for participants to share their scholarly activities with education colleagues through a research abstract. The submission deadline is March 15, 2012.

For more information, log on to www.aarc.org/resources/summer_forum/index.asp. To request a mentor, volunteer as a mentor, or for questions about the education research abstracts, contact: MDeSilva@massasoit.mass.edu, (508) 922-2996. ■

Rhode Island Hospital/Hasbro Children's, Providence, RI

Brookdale University Hospital and Medical Center, Brooklyn, NY



Summit Medical Center, Nashville, TN

Industry Profile: Airon Corporation

Airon President and CEO Eric Gjerde, RRT, talks about his company and how it is working to meet the needs of respiratory therapists and their patients.

Airon President and CEO Eric Gjerde, RRT

AARC Times: How long has your company been in business, and what kinds of devices do you manufacture?

Gjerde: Airon Corporation was formed in 1997 to bring a unique transport ventilator design to the market. The original concept was developed in the 1980s at Shands Hospital, University of Florida, by Paul Blanch, a member of the respiratory therapy department. Several prototypes were made by Paul and used in their helicopters and hospital. We worked for six years finalizing the design and received our first approval from the U.S. Food and Drug Administration (FDA) in 2003.

Airon currently manufactures three different transport ventilators under the pNeuton brand and one critical care mask CPAP system (MACS) in Melbourne, FL. The core technology in all of these products is advanced pneumatics, operating without the need of batteries or electricity. Our pure pneumatic technology provides robust devices designed to last, with minimal maintenance and full MRI compatibility. The pNeuton ventilators are used in hospitals, emergency care, and disaster planning.

AARC Times: What projects or new features are you working on for the future?

Gjerde: Through focus group input with neonatal/pediatric RTs, Airon has recently completed design specifications for a new infant ventilator, the pNeuton mini. The pNeuton mini received CE approval in July for international sales, and we anticipate FDA approval in Q1 2012. The pNeuton mini will provide RTs with the first new transport ventilator in many years that is designed for infant to pediatric patients. It will include our patented pneumatic designs, with a built-in oxygen blender and full alarms. The mini will be ideal for high-acuity delivery rooms and NICUs, as well as inter- and intra-hospital transports. Its MRI compatibility will now allow comprehensive diagnostic procedures for this patient population.

AARC Times: How do your products improve patient care, and how does this impact the respiratory therapist?

Gjerde: Pure pneumatic systems are the unsung heroes of critical care ventilation. Many years ago, they

PSRC Lobby Day

Mercy Hospital – St. Louis/University of Missouri, Columbia, MO

Read more about RC Week 2011 at www.AARC.org.

were the only reliable ventilators available. Now electronics and microprocessors have made ventilators much more sophisticated. But good, solid pneumatic ventilators are critical in many clinical situations. They are the cornerstone of ventilation in emergency medical services (EMS). Now, after the Katrina and Joplin, MO, disasters, RTs are again looking at pneumatic ventilators for disaster preparation. The recent power loss in Southern California once again demonstrated that battery-operated ventilators are not helpful when power is off for long periods. The pNeuton ventilators can stay on the shelf for years with no maintenance, but will start right up and run for days from hospital oxygen systems.

Our MACS continuous positive airway pressure (CPAP) system, a portable critical care mask CPAP device, has also proven to improve patient care. Deployed by many EMS organizations, the MACS supports patients with many forms of respiratory distress and reduces the need for field intubations. Reducing intubations decreases the high health care costs of placing these patients on ventilators in the ICUs. In fact, the National Association of EMS Physicians just issued a position statement encouraging the use of noninvasive ventilation in EMS. The MACS is also being applied within the hospital environment for rapid response teams and emergency room care.

AARC Times: Do RTs work for your company and, if so, in what capacity? How has having a respiratory therapist impacted your product line?

Gjerde: As a Registered Respiratory Therapist myself, I have always used my critical care and hospital management experience in the product design and strategic plans for Airon. Pamela Fry, our vice president, is also an RRT and directs our marketing and educational efforts. We both have over 25 years in product development, market analysis, and clinical application within the respiratory device industry. Airon also uses many RTs as clinical consultants for user design and testing. We constantly talk to RTs from many areas of the country and internationally to refine our products and develop new ideas. I can't imagine being in this business without my respiratory therapy experience and the help of so many RTs over the years.

AARC Times: How do you expect the economy and health care reform to affect how you develop new respiratory care technology over the next two years?

Gjerde: I am concerned about how the current budget crisis in Washington will affect government health care spending programs. For example, the pNeuton S ventilator and MACS CPAP system are well positioned for EMS. However, EMS agencies are very dependent on government grants to upgrade their medical equipment capabilities. Proven new technologies that reduce heath care costs (e.g., face mask CPAP) may be left out if government programs are slashed to address Washington's budget woes.

For Airon, we take a worldview on product development. Our products are now sold in 28 countries, many of which have healthy economies and need new medical technology. Input from both domestic and international activities provides the backbone to continue our technology growth. Our new products will keep coming, focused on where pneumatic technology fits the best.

AARC Times: Where do you see the respiratory device industry heading?

Gjerde: I suspect most ventilator companies will continue their drive toward greater use of sensor technology to automate ventilation. While this is probably good for patient care, I worry about what happens when things go wrong. As a critical care therapist from the 1970s, we were always prepared for power loss or a myriad of other disasters. I don't see many companies focused on these issues now. ■

Saint Agnes Medical Center, Fresno, CA

Charles Cole Hospital, Coudersport, PA

Meriter Hospital, Madison, WI

Military Minute: Andrew Jacob Wagoner, RRT-NPS

Andrew Jacob Wagoner

***AARC Times*:** Which branch of the service are you in, and how long have you served?
Andrew Jacob Wagoner: I'm a staff sergeant in the Wisconsin Army National Guard and have served since October of 2001.

***AARC Times*:** Where have you served?
Wagoner: In the United States and in Kuwait and Iraq.

***AARC Times*:** What was your most interesting or heartwarming experience related to your military service?
Wagoner: The missions I am most proud of are our stateside emergency missions. I have been able to take part in two missions after local flooding devastated our area. It's very nice to be able to serve our community. However, some of my most exciting missions have been on deployments. I was deployed to Kuwait/Iraq from May 2003 to January 2004, and then again to Iraq from February 2009 to January 2010. During the first deployment we did engineering missions and base/forward operating base security. Every once in awhile we were able to go on convoys with another company in our battalion as well.

On our second deployment, we were stationed at Camp Cropper in Baghdad. It is a detainee facility housing detainees we had captured through the duration of the war. I was in charge of one zone in the facility that housed anywhere from 300–420 detainees who were captured for various reasons, including violence against coalition forces, possessing illegal weapons, or financing insurgency, among others. It was a very interesting place to work.

***AARC Times*:** How has your military service enhanced your career as a respiratory therapist?
Wagoner: My military experience has nothing to do with respiratory therapy, but it has been a great experience so far and has taught me so much about being a good employee, leader, and generally a good person. It has taught me how to be self-motivated, to always have a goal, and always be working toward achieving that goal. The military taught me how to be able to think and react during stressful situations and make reasonable judgment calls to accomplish the mission or task at hand — all skills a good RT should have.

***AARC Times*:** Where do you work today?
Wagoner: I'm a respiratory therapist at Gundersen Lutheran in La Crosse, WI.

If you're an AARC member on active duty with the U.S. military or a veteran of service, go online to www.aarc.org/go/mm/ to participate in our "Military Minute" Q&A. ■

Prince Sultan Military College of Health Sciences, Dhahran, Saudi Arabia

Texas Health Harris Methodist Hospital Hurst-Euless-Bedford (HEB), Bedford, TX

Bronx Lebanon Hospital Center, Bronx, NY

▶ Transitions

Kathryn Mulloney, CRT, passed away in late August. A 20+ year veteran of the U.S. Marines, she most recently served as a respiratory therapist at Kindred Hospital in Green Cove Springs, FL. Mulloney was 48.

We welcome news about AARC members. Submit job changes, awards, and death notices online at www.AARC.org/transitions. ■

Nominate an AARC Member for "Success Stories" or "Interesting People"

Do you know an AARC member who would be a good choice for one of our "people" features in "RC Currents"? If so, provide this information to the editor at the address below: the member's name, job title, place of work, city, and state; why you think they should be featured; and their contact information. Send to: Editor Marsha Cathcart, cathcart@aarc.org with "Success Stories" in the subject line. ■

NIPPV Use Increases, But Mortality for Some Is Also Up

The use of noninvasive positive pressure ventilation (NIPPV) in the treatment of COPD patients increased markedly between 1998 and 2008, but for some patients the therapy resulted in a higher risk of death. Those are the take-home messages from a new study conducted by U.S. investigators who reviewed clinical patient data gathered in a large national database.

The researchers examined changes in the frequency of NIPPV and invasive mechanical ventilation (IMV) use and compared patient demographics, income status, payer type, hospital region, and hospital type among patients who initially received NIPPV, IMV, or no respiratory support after hospital admission. They also examined in-hospital mortality, length of stay, and total hospitalization charges, and compared those outcomes among patient groups.

Although the annual number of hospitalizations for acute exacerbations remained relatively constant during the 10-year period, there was a fourfold increase in the use of NIPPV, which grew to overtake IMV as the most frequently used form of respiratory support for patients hospitalized with respiratory failure due to acute exacerbations. A steady decline in mortality was seen among most patients studied, but patients who used NIPPV and were then transitioned to IMV had significantly higher mortality rates than other patients. The mortality rate in these transitioned patients increased during the study period as well while mortality rates of the other groups declined. Patients in this group also experienced the greatest increase in hospital charges and longest hospital lengths of stay.

"The concerning finding in our analysis was the high mortality in the group of patients who, despite initial treatment with NIPPV, required subsequent placement on IMV," notes Fernando Holguin, MD, MPH, from the University of Pittsburgh School of Medicine. "It is notable that this finding is contrary to that found in the carefully monitored patient environment of clinical trials, where those transitioned from NIPPV to IMV did not have higher mortality than patients placed on IMV from the beginning."

The research was published online ahead of print by the *American Journal of Respiratory and Critical Care Medicine* in October. ■

Delray Medical Center, Delray, FL

Drayton Valley Hospital & Care Centre, Drayton Valley, Alberta, Canada

Ohio Member Happy To Lend a Helping Hand

Kelly Moore works with one of her pulmonary rehabilitation patients in a local gym.

According to a recent article on CNN.com, the number of uninsured Americans rose from 49 million in 2009 to 49.9 million in 2010, with much of the increase attributed to the loss of employer-based coverage due to unemployment and employer cutbacks on benefits. For people with chronic respiratory conditions, this loss of health care coverage can be devastating because they rely on regular care and medications to keep those conditions under control. Free clinics often help fill the gaps; and AARC member Kelly Moore, BA, CRT, says that's been the case in her hometown of Zanesville, OH.

"The Muskingum TB and Respiratory Clinic, more commonly known as 'Rambo,' is a county non-profit medical respiratory clinic dedicated to serving the pulmonary needs of Muskingum County residents," says Moore, who serves as the clinic's full-time RT. The facility can trace its roots back to 1954, when the widow of Dr. Cyrus Rambo, a local surgeon and physician who always devoted a part of his day to caring for those who could not afford to pay him for his services, donated property to the Muskingum TB Association as a living memorial to her husband. In 1961, the county passed a tax levy to support the clinic, and operations commenced in June of 1962.

Today the clinic offers everything from pulmonary rehabilitation, to a respiratory equipment loan program, to flu shots. Moore came on board in 2007 after first serving on the Muskingum Respiratory Care Association Board and is actively involved in working with patients both in the clinic and out in the community. "From May to October, we are at the Farmer's Market offering blood pressure and pulse ox screenings for anyone there. When it's flu season, you can see us at health care, business, and service organizations providing flu shots to employees and residents of independent, assisted living, and long-term health care facilities." In total, Rambo staff visit 170 different locations as well as servicing the clinic.

Moore runs the pulmonary rehabilitation program out of a local gym, where the owner has graciously agreed to allow patients to come and exercise for free. "Our pulmonary rehab program is based on guidelines from the American Association of Cardiovascular

Sauk Prairie Memorial Hospital & Clinics, Prairie du Sac, WI

Ranken Jordan – A Pediatric Specialty Hospital, St. Louis, MO

Somerset Community College/St. Joseph's Hospital, London, KY

The Rambo clinic staff is dedicated to meeting unmet needs in their community.

and Pulmonary Rehabilitation," says the therapist. "Typically we have five to six people per group and meet three days per week. We have access to the gym five days per week, which allows us flexibility in our schedule."

The respiratory equipment loan program provides oxygen concentrators and aerosol machines to people in need, and Moore and her nursing colleagues follow up with the patients in their homes to perform clinical assessments, check the equipment, and talk with the patients to see if they may need any of the other services provided by the clinic, such as tobacco-dependence counseling, asthma education, assistance with medication costs, overnight oximetry, or an appointment with the clinic physician, among others.

"The one thing I hear from our patients over and over is how appreciative they are for the services we provide," says Moore. "To know they can get their oxygen, have help with medications, see our clinic physician, and not have to worry about if they can pay for it makes their life a little easier." As for herself and the rest of the staff, she says they just feel good knowing they can offer services to people in their community wherever they find a need — whether that be in the clinic, at their homes, or even at the local farmer's market.

"We get to do a job that makes a difference in someone's life," she says. "I, along with the rest of our group, am happy that we get to say, 'Yes, we can help you.'" ■

Read the Rest of the Story at AARC.org

- AARC will fight pulmonary rehab payment reduction — www.aarc.org/headlines/11/11/payment_reduction.cfm
- AARC opposes weakening of air pollution regulations — www.aarc.org/headlines/11/11/pollution_regulations
- Italian translation of "A Guide to Aerosol Delivery Devices for Respiratory Therapists" now available — www.aarc.org/headlines/11/11/italian_aerosol_book.cfm

Contribute to Writer's Corner

AARC Times is currently considering brief stories from AARC members for publication in the Writer's Corner section of "RC Currents." Submissions should be under 500 words and contain a cover letter with the member number, contact information such as phone and fax numbers, and email address. Send submissions to cathcart@aarc.org with "Writer's Corner" in the subject line. ■

The Medical Center of Aurora, Aurora, CO

University of California San Diego Medical Center, San Diego, CA

Phelps County Regional Medical Center, Rolla, MO

Strange But True…

No smoking (or smoke smell): Christus St. Frances Cabrini Hospital in Alexandria, LA, is not only banning its employees from smoking on the job, it's also instituting a rule that staff cannot work if their clothes even smell like smoke. The goal is to reduce patient exposure to toxins that can linger on fabrics long after the cigarette is snuffed out.

Fun and games in the ICU: Johns Hopkins researchers report good results from a physical therapy program in the ICU that incorporates 20 minutes of play on the Nintendo Wii or Wii Fit video game consoles. Games like boxing and bowling helped patients improve stamina and balance.

Super-sized amoebas: Scientists at Stanford University have found evidence of ancient amoebas that were 10 centimeters long. They credit the behemoths to a spike in oxygen about 300 million years ago that fueled their growth.

Health care on the go: Ford Motor Co. is working on voice-controlled in-car connections to health and wellness applications ranging from glucose monitoring devices, to asthma management tools, to Web-based allergen alert solutions.

Brilliant! Listening to Mozart helped two endoscopists (at the University of Texas Health Science Center at Houston) detect more adenomas during colonoscopies in a new study. The "Mozart Effect" is thought to arise from a significant short-term improvement in spatial temporal reasoning that occurs while people listen to his music.

Olive oil detox: Before antibiotics came along, researchers experimented with lots of different things to stem infections like pneumonia. But olive oil injections? Yep, they were tried — and with some success — by two British physicians in the 1930s who found the olive oil detoxified pneumonia toxins circulating in the blood. ■

Lung Regeneration Takes a Step Toward Reality

Researchers at Weill Cornell Medical College are opening the door to regeneration of lung tissue. In studies conducted in mice, they have uncovered the biochemical signals that trigger generation of new lung alveoli. The regenerative signals originate from the specialized endothelial cells that line the interior of the blood vessels in the lung.

While it has long been known that mice can regenerate and expand the capacity of one lung if the other is missing, the investigators believe their study now identifies the molecular triggers behind the process. They also believe the findings may be relevant to humans. "It is speculated, but not proven, that humans have the potential to regenerate their lung alveoli until they can't anymore, due to smoking, cancer, or other extensive chronic damage," says lead author Dr. Shahin Rafii. "Our hope is to take these findings into the clinic and see if we can induce lung regeneration in patients who need it, such as those with chronic obstructive pulmonary disease." The study was published in the Oct. 28 issue of *Cell*. ■

Members, Send Us Your Human Interest Stories

Have you been active in a ventilator-dependent kids' summer camp? Have you helped an elderly patient in need? Have you saved a life outside of a health care facility? *AARC Times* is always searching for stories from AARC members that relate special experiences.

If you have a human interest story to share with our readership, please contact *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org. ■

Pig Lung display at Carle Hospital, Urbana, IL

Georgia State University, Atlanta, GA

Substance May Boost Corticosteroid Effectiveness in COPD

Could treatment with sulforaphane — an ingredient found in broccoli and other vegetables — improve the effectiveness of corticosteroids in people with COPD? New research out of Johns Hopkins Bloomberg School of Public Health suggests the answer may be yes.

The study grew out of the knowledge that histone deacetylase 2 (HDAC2), a critical component in a chain of reactions that enable corticosteroids to reduce inflammation, is substantially reduced in the lungs of COPD patients. In the current study, S-nitrosylation, which occurs from exposure to cigarette smoke, was found to cause HDAC2 dysfunction and lead to corticosteroid insensitivity in the alveolar macrophages of the lungs of individuals with COPD.

Since previous research by the same team showed sulforaphane activates the nuclear factor erythroid 2-related factor 2 (Nrf2) pathway involved in COPD, the investigators decided to see if it would have an effect on HDAC2. Results showed sulforaphane effectively restored HDAC2 activity and corticosteroid sensitivity in alveolar macrophages taken from COPD patients. "Restoring corticosteroid sensitivity in patients with COPD by targeting the Nrf2 pathway holds promise for effectively treating exacerbations," study author Shyam Biswal, PhD, was quoted as saying. The study was published ahead of print in the *Journal of Clinical Investigation* on Oct. 17. ■

ECMO Increases Survival Rates for H1N1 Patients

H1N1 patients who were treated with extracorporeal membrane oxygenation (ECMO) had a lower rate of in-hospital death than similar patients who did not receive the treatment, report British researchers publishing in JAMA.

The study began with 80 patients who were referred, accepted, and transferred to one of four U.K. ECMO centers. Sixty-nine of the patients received ECMO, and these were compared to 59 matched pairs of ECMO-referred patients and non-ECMO-referred patients identified using individual matching, 75 matched pairs identified using propensity score matching, and 75 matched pairs identified using GenMatch matching.

The hospital mortality rate was 23.7% for ECMO-referred patients versus 52.5% for non-ECMO-referred patients when individual matching was used, 24% versus 46.7% when propensity score matching was used, and 24% versus 50.7% when GenMatch matching was used. "The survival curves indicate a considerable number of early deaths among the non-ECMO-referred patients," note the authors. "The benefit of ECMO persisted after repeating the survival analysis and excluding the matched pairs in which either the ECMO-referred patient or the non-ECMO-referred patient died during the first 48 hours." ■

Advocate Christ Medical Center, Oak Lawn, IL

University of Texas Medical Branch, Galveston, TX

New Members

Welcome to the AARC

U.S. Members

Green, Allan, Anchorage, Ak*

Bell, Amy, Huntsville, Al*
Cook, Nanette, Coker, Al*
Dalola, April, Daleville, Al*
Eppes, Tina, Red Level, Al*
Franklin, James, Wellington, Al*
Johnson Holmes, Marsha, Alabaster, Al*
Martin, Kaye, Auburn, Al*
Minton, Julie, Fort Payne, Al*
Mulkin, Donna, Kimberly, Al*
Palomino, Hernando, Mobile, Al*
Southerland, Patty, Decatur, Al*
Sullivan, Starla, Daphne, Al*
Tatum, Ginger, Birmingham, Al*

Bauer, Laurie, Hot Springs, Ar*
Britton, Paul, Sherwood, Ar*
Conkleton, Bettye, Texarkana, Ar*
Hooper, Mimi, North Little Rock, Ar*
Meyers, Mark, Hot Springs Village, Ar*
Pitts, Rusty, Ward, Ar
Smith, Emily, Berryville, Ar
Walker, Joseph, Pine Bluff, Ar

Buchanan, Karen, Phoenix, Az
Chang, Rachel, Phoenix, Az*
Figueroa, Raul, Scottsdale, Az
Griffin, Andrew, Higley, Az*
Larsen, F Lena, Phoenix, Az*
Larson, Andrea, San Tan Valley, Az*
MacDonald, Daniel, Phoenix, Az*
Neely, Rosa, Mesa, Az*
Tordsen, Micah, Tucson, Az

Amato, Mara, San Bruno, Ca*
Amos, Madeline, Stockton, Ca*
Antunez De Mayolo, Mariana, Carmichael, Ca*
Bahneman, Kurt, Irvine, Ca
Baumanns, Robert, Palm Springs, Ca*
Broshar, Kathryn, Folsom, Ca*
Bui, Minh, Temple City, Ca*
Butterfield, Kristie, Santa Cruz, Ca*
Cervantes, Alberto, Anaheim, Ca
Collier, Grace, Sacramento, Ca*
Curran, Theresa, Santa Rosa, Ca*
Dillingham, Thomas, Aliso Viejo, Ca
Dunn, Cari, Rancho Cucamonga, Ca*
Evalle, James, Long Beach, Ca*
Fields, Wayne, Van Nuys, Ca*
Foster, Grant, Oceanside, Ca*
Fowkes Cushing, Dawne J, Ventura, Ca*
Govan, Anjoo, Irvine, Ca*
Huynh, Judy, Monterey Park, Ca
Jahandary, Mahssa, Reseda, Ca
Jankowski, Marie, Orangevale, Ca
Jennings, Tracy, San Diego, Ca
Jones-Dollar, Koralee, Chester, Ca*
Kallis, Trista, Encinitas, Ca*
Khoury, Karl, San Diego, Ca*
Korneff, Neil, Yorba Linda, Ca
Legaspina, Mayannrose, San Diego, Ca
Lu, Tao, Diamond Bar, Ca*
McMahon, Michael, Yorba Linda, Ca
Muth, Michael, Los Angeles, Ca*
Nguyen, Tan, Garden Grove, Ca*
Noblet, Charito, Modesto, Ca*
Nunes, Joseph, Camarillo, Ca*
Obligacion, Josephine, Orange, Ca*
Ortiz, Liseth, Montebello, Ca*
Palmer, Kristina, Citrus Heights, Ca*
Paolicelli, Jonathan, Vista, Ca*
Park, John, Fremont, Ca*
Patton, Hans, Glendale, Ca
Porto, Arlene, Chula Vista, Ca*
Quinn, Timothy, Carlsbad, Ca*
Ramos, Elmer, Rialto, Ca*
Razon, Donnie Dale, Oakland, Ca*
Regadio, Albert, West Sacramento, Ca*
Reinhart, Christina, Corona, Ca*
Renee, Yvonne, Reseda, Ca
Ruiz, Erika, Chula Vista, Ca
Rustad, Andre, Etiwanda, Ca
Rutherford, Richard, Lincoln, Ca
Samoylova, Olga, Cupertino, Ca*
Solanke, Fakolejo, Lemon Grove, Ca*
Soolefai, Mariechris, San Diego, Ca*
Sun, Dongmei, Monterey Park, Ca*
Taylor, Gabrielle, Norwalk, Ca
Tench, Kerri, Sacramento, Ca*
Tompkins, Kyle, Roseville, Ca
Transu, Natalie, El Monte, Ca
Turner, Andrea, Oceanside, Ca
Varga, Christopher, Yorba Linda, Ca
Villanueva, Christopher, Burbank, Ca*
Wasche, Jill, Oroville, Ca*

Benda, Charla, Loveland, Co*
Dupre, Isabel, Pueblo West, Co*
Gonzales, Patrick, Pueblo, Co*
Gookin, Christine, Rye, Co*
Griswold, Brandon, Colorado Springs, Co*
Krupski, Theresa, Denver, Co*
Medina, Deena, Pueblo, Co*
Metcalf, Thomas, Castle Rock, Co
Sam Taiti, Barbara, Colorado Springs, Co
Sanchez, Roseann, Pueblo, Co
Saxton, Elizabeth, Pueblo, Co*
Scott, Crintz, Pine, Co*
Vecchio, Ranee, Pueblo, Co*
Vigil, Paulette, Pueblo, Co*

Addy, Daniel, Farmington, Ct
Arbona, Yolanda, Waterbury, Ct*
Carilli, Paul, Wethersfield, Ct
Cooper, Taryn, Windsor Locks, Ct
Dedominicis, Suzanne, Salem, Ct
Frischstein, Julie, Easton, Ct*
Hinckley, Natasha, Ellington, Ct
Martin, Karen, North Haven, Ct
McGrath, Amy, Tolland, Ct
Morascini, Anthony, Willington, Ct
Okantah, Samual, East Hartford, Ct
Opokuware, Richmond, East Hartford, Ct
Rivard, Christina, Manchester, Ct
Rivera, Lylcadia, Hartford, Ct
Rodriguez, Louis, Stamford, Ct*
Sarfo, Julius, Hartford, Ct
Sekongo, Oussoumane, New Britain, Ct
Serrano, Danniella, Manchester, Ct
Smith, Keishia, New Haven, Ct*
Swaby, Melissa, Bridgeport, Ct*
Vasseur, Stephanie, Vernon, Ct
Vildozola, Marisa, South Windsor, Ct
Walker-Wilson, Taniesha, East Hartford, Ct
Wilcox, Michelle, Prospect, Ct*

Anthony, Ana, Washington, DC*

Foster, Tracy, New Castle, De*
Hampe, W Matthew, Middletown, De*
Jacobson, Pamela, Ellendale, De*
Messick, Amy, Dover, De*
Palis, Jessica, Felton, De*
Renard, Charlene, Dover, De
Simpson, Carey, Middletown, De*
Uhler, Peggy, Newark, De*

Abibula, Dayne, Fort Myers, Fl
Albino, Juan, The Villages, Fl
Arriaga, Francisco, Hollywood, Fl
Augustine, Alisha, Tampa, Fl*
Avariano, Arleen, Cutler Bay, Fl*
Barionnette, Jenny, Cape Coral, Fl
Benoit, Felicia, Fort Lauderdale, Fl
Betts, Fanny, Fort Myers, Fl
Bowen, Michael, Bradenton, Fl*
Bowman, Nancy, Eustis, Fl*
Bruno, Giovannic, Fort Myers, Fl
Brylski, Jan, Tampa, Fl*
Chau, Raymond, Hollywood, Fl
Chinnis, Beverly, Fleming Island, Fl*
Clasen, Princess, Cape Coral, Fl
Corbin, Kristi, Fort Lauderdale, Fl
Crossman, Sherie, Fort Myers, Fl
Dean, Shannon, Fort Myers, Fl
Diaz, Stephan, Pompano Beach, Fl
Dye, Kelly, Fort Myers, Fl
Eddie, Monique, Fort Myers, Fl
Edouard, Jean, Naples, Fl
Escarfullery, Carmen, Chuluota, Fl*
Estey, Nancy, North Lauderdale, Fl*
Etienne, Marguerite, Lehigh Acres, Fl
Faurot, Bobbi Jo, Fort Pierce, Fl*

These individuals have been approved for membership in the AARC. Any member may object to a new membership by filing a written objection with the Executive Office within 30 days. *Active Members

Gold, Barbara, Cape Coral, Fl
Green, Lisa, New Por Richey, Fl*
Hall, Carole, Hilliard, Fl*
Harris, Dianne, Opa Locka, Fl
Hinton, Christopher, Naples, Fl*
Howard, Kezia, Fort Myers, Fl
Jacques, Carlie, Tamarac, Fl
Jeanlouis, Valelie, Cape Coral, Fl
Jeannis, Sandra, Lehigh Acres, Fl
Jones, Joshua, Fort Lauderdale, Fl
Khan, Jahan, Hollywood, Fl
Khowais, Barbara, New Port Richey, Fl*
Knox, Jason, Lakeland, Fl*
Lambert, Saly, Cape Coral, Fl
Laroche, Cynthia, Cape Coral, Fl
Lohnes, Jennifer, Nort Port, Fl
Louis, Kesmane, Lehigh Acres, Fl
Luft, Faye, Sarasota, Fl*
Lugo, Jacqueline, Cape Coral, Fl
Mendez, Casmen, Fort Myers, Fl
Meyer, Desiree, Cape Coral, Fl
Miller, Ryan, Alachua, Fl
Mitchell, Natalie, Orange Park, Fl*
Neal, Debra, Newberry, Fl*
Nelson, David, Hudson, Fl*
Paquette, Leo, Melbourne, Fl*
Pfalzgraf, Jenny, Fort Myers, Fl
Pierre, Fleorestil, Fort Myers, Fl
Ramos, Sagrario, Naples, Fl
Richardson, Retricia, Winter Haven, Fl
Rivas, Jessica, Pompano Beach, Fl
Scott, Nicole, Cape Coral, Fl
Silva, Kristin, Port Charlotte, Fl
Simmons, Pamela, Navarre, Fl*
Simpson, Nardia, Fort Lauderdale, Fl
Small, Zoe, Pompano Beach, Fl
Smith, Matthew, Lakeland, Fl*
Switzer, Lynn Renee, Palm Coast, Fl*
Sylvain, Paul, Fort Lauderdale, Fl
Thomas, Deborah, Jacksonville, Fl*
Traylor, William, Delray Beach, Fl*
Wilkerson, Nancy, Cape Coral, Fl
Williamson, Melanie, Cape Coral, Fl
Wood, Alycia, Cape Coral, Fl
Yataco, William, Fort Lauderdale, Fl

Adefila, Glory, Lilburn, Ga*
Allen Lithgow, Melissa, Marietta, Ga*
Alshehri, Riyadh, Atlanta, Ga
Coachman, Latoya, Thomasville, Ga*
Crews, Tyrone, Jonesboro, Ga
Croft, William, Lawrenceville, Ga*
Hamer, Jeff, Columbus, Ga*
Henderson, Kevin, Albany, Ga
Hicks, Stacy, Smyrna, Ga*
Kelley, Charles, Canton, Ga*
Krikorian, Karin, Alpharetta, Ga*
McMillan, Russell, Cumming, Ga*
O'Neill, Dawn, Acworth, Ga*
Patni, Shafina, Norcross, Ga*
Reyes, Viviam, Hahira, Ga*
Rittenhouse, Michael, Athens, Ga
Roberts, James, Hampton, Ga*
Rutherford, Nathan, Adrian, Ga*
Schumacher, James, Cumming, Ga
Smith, Kenneth, Savannah, Ga*
Walker, Devonie, Atlanta, Ga*
Wallace, Derreck, Stone Mountain, Ga*
White, Maggie, Decatur, Ga*
Wigington, Rhonda, Cumming, Ga

Castle, Pamela, Bettendorf, Ia*
Cole, Matt, Urbandale, Ia
Fuller, David, Corning, Ia*

Almutiri, Abdulrahman, Boise, Id
Anderson, Karen, Post Falls, Id*
Jackson, Christopher, Caldwell, Id
Singh, Gail, Meridian, Id*
Sorenson, Martin, Rupert, Id*

Anderson, Wendy, Rockford, Il*
Antros, Peter, Chicago, Il*
Bader, Farheen, Itasca, Il*
Barnett Johnson, Tiffany, University Park, Il*
Coombes, Paula, Paris, Il*
Davis, Samantha, Chicago, Il*
Decross, Lijy, Waukegan, Il*
Ejma, Cindy, Aurora, Il
George, Shyju, Lake Villa, Il*
Hantke, Rick, Libertyville, Il
Hartsell, Denise, Chicago, Il*
Hickcox, Nicole, Roscoe, Il*
Johnson, Thomas, Niles, Il*
Keller, Rebecca, Rockford, Il*
Kidd, Laken, Troy, Il*
Kohlberg, Cathy, Belleville, Il*
Linden, Juany, Plano, Il*
Loddeke, Pamela, Breese, Il*
Mathunny, Jose, Streamwood, Il*
Metrick, Kathleen, Chicago, Il*
Murphy, Sara, Berwyn, Il*
Parise, Joanne, Mt Prospect, Il*
Paula, Murray, Robinson, Il*
Reisinger, Denise, Ashton, Il*
Reynolods, Mary, Springfield, Il*
Shimkus, Joan, Bartlett, Il*
Studdard, Nicole, North Aurora, Il*
Varughese, Bincy, Mount Prospect, Il*
Vazquez, Hilary, Plainfield, Il*
Wise, Nicole, Rushville, Il*

Carter, Sally, Evansville, In
Couchman, Paul, Lebanon, In*
Davis, Katherine, Westfield, In*
Domer, Stephen, Valparaiso, In*
Feenstra, Jordan, Indianapolis, In*
Ford, Brooke, Indianapolis, In
Goldbach, Molly, Chandler, In
Graham, Kyley, Huntingburg, In
Horty, Abby, Evansville, In
Howe, Joe, Indianapolis, In*
Judy, Baylie, Bennington, In
Lopez, William, South Bend, In*
Miles, Brittney, Elberfeld, In
Neukam, Jarod, Evansville, In
Olsen, Glenn, Evansville, In
Perkins, Heather, Carmel, In*
Raikes, Debra, Avon, In*
Simpson, Regina, Indianapolis, In*
Snider, Kasey, Fishers, In*
Waddell, Antonio, Evansville, In
Wargel, Diana, Evansville, In
Wedding, Hailey, Evansville, In
Wenzel, Tara, Jasper, In
Worland, Megan, Washington, In
Zacarias, Ricardo, Evansville, In

Almutairi, Hejab, Kansas City, Ks
Alshahrani, Mussaed, Kansas City, Ks
Alshehri, Ziyad, Kansas City, Ks
Augustine, Nathan, Hays, Ks*
Beeves, Karah, Lawrence, Ks
Bryant, Jason, Olathe, Ks
Divilbiss, Dana, Overland Park, Ks
Ewing, Lindsay, Lawrence, Ks
Flippin, Lindsey, Merriam, Ks
Ibarra, Joseph, Overland Park, Ks
Kinzel, Helen, Kansas City, Ks*
Lashure, Mary Margaret, Lawrence, Ks
Martin, Luenda, Galena, Ks*
Ni, Jierui, Kansas City, Ks
Norris, Brenda, Columbus, Ks
Oehlert, Gregory, Topeka, Ks
Rezayazdi, Michael, Lawrence, Ks
Rickert, Stephen, Olathe, Ks*
Shook, Celia, Derby, Ks
Vogt, Serenity, Udall, Ks

Baddeley, Carolyn, Elsmere, Ky*
Crider, James, Prestonsburg, Ky*
Daukas, Chastity, Lexington, Ky*
Embry, Wendall, Caneyville, Ky*
Fultz, Tabitha, Thornton, Ky*
Holley, Mike, Walton, Ky*
Keen, Mike, Flatwoods, Ky*
Leibee, Heather, Ashland, Ky*
Okerson, Robert, Paducah, Ky*
Partin, Shauna, Lexington, Ky*
Perkins, Danny, Albany, Ky*
Wells, Kyle, Grayson, Ky*
Williams, Debbie, Louisville, Ky*
Williams, Mary, Winchester, Ky*

Bourne, Linsey, Kenner, La
Gaar, Heather, Shreveport, La*
Harris, Lacy, Oak Grove, La*
Hingle, Maria, Metairie, La*
Hoang, Christine, New Orleans, La
Johnson, Robert, Kenner, La*
Ladner, Brandi, New Orleans, La*
Lafont, Lucie, New Orleans, La
Nguyen, Namtran, Harvey, La
Nguyen, Rhonda, Saint Rose, La
Stehr, Celeste, Haughton, La*
Stewart, Dionne, New Orleans, La
Thibodaux, Bryan, Bourg, La*

Adams, Beverly, Marshfield, Ma
Anagam, Omar, Lawrence, Ma
Badger, Donna, Groveland, Ma
Barahona, Francisco, Lawrence, Ma
Brennick, Elizabeth, Pembroke, Ma
Brown, Katie, Haverhill, Ma
Cateon, Kimberly, Assonet, Ma*
Cipoletta, Michael, Haverhill, Ma
Cuddy, Fernanda, Arlington, Ma
D'india, Michelle, Wilmington, Ma
Dirienzo, Christopher, Natick, Ma*
Doherty, Alana, Georgetown, Ma
Estevez, Adolis, Lawrence, Ma
Hounane, Hassan, Methuen, Ma
Krisko, Eliza, Ipswich, Ma
Lugya, Barbara, Haverhill, Ma
Mirabal, Lucrecia, N Andover, Ma
Nelson, Stephen, Woburn, Ma
Peasley, Joyce, Groton, Ma
Petroff, Tamara, Boston, Ma*
Sainato, Gina, Everett, Ma
Soto, Nilsa, Lawrence, Ma
Walker, David, Shrewsbury, Ma*
Wanguthi, Vivers, Methuen, Ma
White, Paula, Raynham, Ma*

Briggs, Sydney, Baltimore, Md
Comegys, Jess, Darlington, Md*
Craig, Leslie, Port Deposit, Md*
De Berry, William, Annapolis, Md*
Greer, Joanna, Montgomery Village, Md
McCann, Preston, Boonsboro, Md
Moore, Adrienne, Rockville, Md*
Mullilgan, Mary, Annapolis, Md*
Pickering, Andrew, Silver Spring, Md*
Thorne, Sydney, Temple Hills, Md*

Beaudry, Judith, Portland, Me*
Lavertu, Greg, Gorham, Me*
Moynahan, Erin, Belgrade, Me*
Puzewski, Thomas, Ashland, Me*
Theriault, Don, Fort Kent, Me*

Archbold, Callie, Clare, Mi*
Clark, William, Carleton, Mi
Crouse, Judith, Marshall, Mi
Deen, Rebekah, Rockford, Mi*
Derosia-Lytle, Ann Marie, Alpena, Mi*
Kanowski, Peggy, Wyandotte, Mi*
Keeler, Janice, Livonia, Mi*
Komerska, Jacqueline, Troy, Mi
Kurlonko, Kim, Clawson, Mi*
Lake, Wendy, Belding, Mi
Longjohn, Sherlyn, Kalamazoo, Mi*
Morris, Christine, Novi, Mi*
Pace, Allison, Canton, Mi*
Smith, Susan, Dundee, Mi*
Triesenberg, Mary, Grand Rapids, Mi*
Wagner, Lola, Bloomfield Hills, Mi*
Wall, Nancy, Grandville, Mi*

Abdi, Rais, Saint Paul, Mn
Beyene, Dereje, Saint Paul, Mn
Bopp, Benjamin, Little Canada, Mn*
Bradseth, Thomas, Eden Prairie, Mn
Giacomini, Robi, Roseville, Mn
Grosse, Meridith, Mounds View, Mn
Habtemaryam, Negasi, Saint Paul, Mn
Hilpisch, Melissa, Lake Elmo, Mn
Hussein, Aglan, Minneapolis, Mn
Imhoff, Susan, Minneapolis, Mn
Janda, Matthew, Crystal, Mn
Johnson Schmidt, Jennnifer, Rosemount, Mn*
Keryo, Shimelis, West Saint Paul, Mn
Labonne, Don, Centerville, Mn
Lapointe, Shannon, Marine On Saint Croix, Mn
Lim, Denjo, Blaine, Mn
Marquette, Margaret, Cottage Grove, Mn
Michael, Tasha, Staples, Mn*
Mohamed, Ismail, Saint Paul, Mn
Nelson, Tony, Saint Paul, Mn
Paulzine, Deanna, St Cloud, Mn*
Rumpca-Hoffman, Michelle, Newport, Mn
Saukko, Tara, Meadowlands, Mn
Sonnen, Mark, Hopkins, Mn
Steinfadt, Michael, Owatonna, Mn*
Thao, Vang, Saint Paul, Mn
Top, Nathan, South Saint Paul, Mn
Wallin, Michael, Lakeville, Mn

Albert, Sarah, Potosi, Mo
Alexander, Benita, Mtn Grove, Mo
Anderson, Tara, Saint Joseph, Mo
Banuelos, Dolores, Saint Charles, Mo
Berra, Ammeris, Fenton, Mo
Bowles, Megann, Saint Louis, Mo
Bullock, Tonya, Bunker, Mo
Burdin, Mary, Sullivan, Mo
Club, Marissa, Rolla, Mo
Combs, Courtney, House Springs, Mo
Engelken, Mandy, Union, Mo
Fisher, Lucinda, Poplar Bluff, Mo*
Gamache, Ben, Wentzville, Mo
Haggard, Jamie, Imperial, Mo
Haley, Chelsea, Saint Louis, Mo
Hardin, Audre, Rolla, Mo
Henson, Brittany, Bourbon, Mo
Johns, Lindsay, Rolla, Mo
Kaplan Stephenson, Jackie, Pevely, Mo
Korbesmeyer, Kristina, Rolla, Mo
Laycook, Monica, Lees Summit, Mo
Lunsford, Becky, Rolla, Mo
Lunsford, Bobby, Rolla, Mo
Maskunas, Brittney, Rolla, Mo
Mercer, Cameron, Sullivan, Mo
Noel, Adrienne, Rolla, Mo
Oberkramer, Elizabeth, Cuba, Mo
Price, Susan, Columbia, Mo*
Sauer, Tyler, Belle, Mo
Shipman, Joe, O'Fallon, Mo
Spencer, Carolynne, Festus, Mo
Stuckhoff, Lya, New Haven, Mo
Tinker, Debbie, Poplar Bluff, Mo*
Todd, Michelle, Sullivan, Mo
Tuschhoff, Beth, Leslie, Mo
Vance, Toby, Carl Junction, Mo*
Wallace, Kristeena, Saint Robert, Mo
Watson, Angela, Saint Louis, Mo
Wells, Tammy, Ballwin, Mo*
Wilkerson, Emily, Saint Robert, Mo
Witt, Brianna, Sullivan, Mo
Wuest, Jennifer, Rolla, Mo
York, Natalie, West Plains, Mo*

Allingham, Thomas, Ridgeland, Ms
Burton, Shirley, Holly Springs, Ms*
Gant, Clifton, Pope, Ms*
Hocevar, Annette, Tupelo, Ms
Richards, Keavonic, Edwards, Ms
Sowell, Darrell, Hernando, Ms*

Alley, Pamela, Belmont, NC*
Berner, Shelly, Beaufort, NC
Branch, Jason, New Bern, NC
Brown, Christy, Hubert, NC
Brown, Johanna, Jacksonville, NC
Colon-Gamez, Jacqueline, Jacksonville, NC
Crawford, Florence, Charlotte, NC*
Cross, Belinda, Morrisville, NC*
Delaroderie, Thomas, Morehead City, NC
Enriquez, Larina, Newport, NC
Hawkins, John, Vanceboro, NC
Humphrey, Lebreska, Jacksonville, NC
Kachhy, Harsh, Cary, NC
Lawrence, Adam, Harkers Island, NC
McIntosh, Donald, Durham, NC
Militano, Thomas, Morehead City, NC
Miller, Jesse, Greenville, NC*
Murphy, Joanna, Beaufort, NC
Poms, Abby, Chapel Hill, NC*
Speller, Angelia, Greensboro, NC
Stephenson, Walter, Morehead City, NC
Tyson, Natasha, Charlotte, NC*
Weast, Celeste, Morganton, NC*
Wetherell, Richard, Cary, NC
Williams, Lora, Jamesville, NC*
Woodring, Callan, Boone, NC*

Grenz, Matthew, Fargo, ND*

Brooks, Jean, Columbus, Ne*
Kiristy, Jacquelyn, Lincoln, Ne*

Bianchi, Linda, Hudson, NH*
Bowen, Patricia, Manchester, NH*
Costello, Kathleen, Salem, NH
Dargie, Kathleen, Milford, NH
Davies, Diane, Londonderry, NH*
Ellis, Shelia, Deerfield, NH*
Foose, Diane, Manchester, NH*
Frace, Michael, Woodsville, NH*
Hurst, Kelly, Manchester, NH
Krajina, Lara, Seabrook, NH
Marcello, Karen, Salem, NH
Murphy, Susan, Nashua, NH*
Pare', Donald, Nashua, NH*
Patrizio, Gregory, Mont Vernon, NH*
Terrio, Dennis, Weare, NH*
Tibbetts, Jeffrey, Newton, NH
Topping, Heidi, Petterborough, NH*
Will, Jo, Salem, NH
Woodside, Lawrence, Manchester, NH

Abrams, Mark, Mount Laurel, NJ
Bertoia, Monica, Vineland, NJ*
Calli, D'nay, Blackwood, NJ
Capella, Patricia, Leonardo, NJ*
Chen, Chen, Wayne, NJ*
Chinnici, Nicholas, Ridgewood, NJ*
Dewald, Patricia, Mays Landing, NJ*
Easom, John, Garfield, NJ
Fajardo, Maria, Avenel, NJ*
Gell, Dorothy, Old Bridge, NJ*
Hedges, Joseph, Trenton, NJ*
Lanting, Maria Nina, Teaneck, NJ*
Lowman, Nate, Magnolia, NJ
Owusu-Mensah, Joyce, Roselle, NJ*
Parylak, Michael, Robbinsville, NJ*
Romeo, James, Deptford, NJ
Shannon, Cybil, Mount Laurel, NJ
Williams, Richard, West Orange, NJ*
Yu, Christopher, Cherry Hill, NJ

Baca-Padilla, Amy, Santa Fe, NM
Casias, Frank, Farmington, NM*
Good, Lindsey, Rio Rancho, NM*
Ingram, Ken, Albuquerque, NM*
Kirchgessner, Dave, Albuquerque, NM*
Plath, Damon, Albuquerque, NM*

Abalos, Maria, Las Vegas, Nv
Ashley, Kelly, Las Vegas, Nv
Bailon, Claribelle, Las Vegas, Nv
Barrientos, Roxanne, Las Vegas, Nv
Beltran, Erasmo, Las Vegas, Nv
Bilynsky-Zepeda, Gracie, Henderson, Nv
Clemente, Christine, Las Vegas, Nv
Curry, Danielle, Las Vegas, Nv
Dearsaw, Tatianna, Las Vegas, Nv
Degraw, Colin, Las Vegas, Nv
Dunson, Vanessa, Las Vegas, Nv
Dykstra, Craig, Pahrump, Nv
Forest, Robin, North Las Vegas, Nv
Kana, Stephanie, Las Vegas, Nv
Law, Tiffany, Las Vegas, Nv
Lim, Manuelito, Las Vegas, Nv
Lopez, Andrea, Las Vegas, Nv
Nilson, Susan, Reno, Nv*
Para, Hector, North Las Vegas, Nv
Perry, Candice, Henderson, Nv
Rhem, Richard, Las Vegas, Nv
Riggs, Teresa, Henderson, Nv
Scott, Kelsey, Las Vegas, Nv
Simmons, Kiandra, Las Vegas, Nv
Sonekeo, Ken, Las Vegas, Nv
Tayong, Len, Las Vegas, Nv
Vasquez, Susana, Las Vegas, Nv
Williams, Santana, Las Vegas, Nv

Anderson, Claudette, Queens Village, NY*
Averion, Renato, Newburgh, NY*
Bannon, Maureen, Malone, NY*
Barizano, Joseph, Brooklyn, NY*
Benson, Emily, Gardiner, NY*
Carey, Kenya, Brooklyn, NY*
Diaz, Alejandro, Hollis, NY*
Duff, Richard, Saratoga Springs, NY
Ferguson, Brian, New York City, NY
Furtado, Milton, Peekskill, NY*
Green, Harvey, New York, NY*
Heath, David, Auburn, NY*
Iweorah, Hillary, Brooklyn, NY*
Jacot, Jerry, Horseheads, NY

Jaime, Dora, Bronx, NY*
Janis, Erica, Frankfort, NY*
Karmakar, Bikromjit, Woodside, NY
Kettle, Michelle, Johnson City, NY*
Labissiere, Malcolm, Valley Stream, NY
Lane, Robert, Syracuse, NY*
Laquitara, Aaron, Waterloo, NY*
McDonald, Michael, Copenhagen, NY*
Milanese, Tracie, Berlin, NY*
Molina, Lisa, Utica, NY*
Mompoint, Ruth, Freeport, NY*
Olaye, Osayande, Bronx, NY*
Owens, Heather, Barneveld, NY*
Pezzullo, Debra, Mahopac, NY*
Plowman, Kenneth, Watervliet, NY*
Redmond, Kilita D, Brooklyn, NY*
Roldan, Sulaika, New York, NY*
Ruetsch, Jeffrey, Syracuse, NY*
Sexton, Wendy, Livonia, NY
Spellane, Loraine, Vestal, NY*
Staudenmayer, Anita, Rochester, NY*
Uguru, John, Hollis, NY*
Varughese, Lovely, Port Chester, NY*
Voltaire, Durocher, Baldwin, NY
Wilkinson, Colleen, White Plains, NY*

Adu-Yeboah, Stephen, Columbus, Oh
Akromas, Aubrey, Solon, Oh
Almahd, Shefa, Akron, Oh
Appleby, Kathryn, Canton, Oh
Archer, Casey, Columbus, Oh
Ashley, Heather, Waynesville, Oh*
Batton, Healy, Columbus, Oh
Brempong, Kwaku, West Chester, Oh*
Cole, Sarah, West Salem, Oh
Damson, Stephen, Wadsworth, Oh
Danner, Kelly, Kent, Oh
Demiglio, Melissa, Columbus, Oh
Denson, Christyn, Akron, Oh
Efobi, Eric, Canton, Oh
Ford, Michael, Poland, Oh*
Gable, Kali, Akron, Oh
Gilcher, Kylie, Lore City, Oh*
Grand, Kenyon, Columbus, Oh
Griffin, Erika, Akron, Oh
Haines, Jessica, Columbus, Oh
Hamel, Nathaniel, Ottawa, Oh
Hamilton, Christie, Akron, Oh
Johnson, Justine, Massillon, Oh
Jones, Alfonso, Boardman, Oh*
Kafun, Stefanie, Medina, Oh
Kagarise, Elisabeth, Westerville, Oh
Karhoff, Jay, Columbus, Oh
Keter, Kaleb, Medina, Oh
King, Lebaron, Dayton, Oh*
Lubuguin, Johnna, Columbus, Oh
Mahathirath, Andre, Columbus, Oh
McMillen, Christine, Columbus, Oh
Moore, Kali, Columbus, Oh
Morton, Rebecca, Columbus, Oh
Moya, Francisca, Gahanna, Oh
Neal, Shantae, Akron, Oh
Negash, Senae, Columbus, Oh
Nye, Joanne, Burgoon, Oh*
Perry, Lynne, Bowling Green, Oh*
Polasky, Sarah, Cuyahoga Falls, Oh
Porter, Kevin, Columbus, Oh
Ransom, Tricia, Bloomville, Oh*
Rhea, Ariel, Westerville, Oh
Saadeh, Kalie, Deerfield, Oh
Schonauer, Evan, Walhonding, Oh
Schultz, Ethan, Macedonia, Oh
Shebeck, Rachel, Masury, Oh
Shephard, Horace, Toronto, Oh*
Stephenson, Christian, Medina, Oh
Stollar, Angela, Canton, Oh*
Suminski, Kieran, Columbus, Oh
Swanton, Courtney, Columbus, Oh
Timock, Danielle, Solon, Oh
Tonathy, Kelsey, Doylestown, Oh
Walker, Alexandra, Columbus, Oh
Ward, Austin, Columbus, Oh
Weaver, Shawna, Columbus, Oh
Wesnak, Emily, Cuyahoga Falls, Oh
Yuce, Basak, Pickerington, Oh

Alvarado, Dana, Sterling, Ok
Avila, Homero, Altus, Ok
Benson, Chuck, Altus, Ok*
Epstein, Jessica, Lawton, Ok
Fowler, Stacy, Oklahoma City, Ok*
Gillespie, Denise, Collinsville, Ok*
Heminkeky, Donahue, Norman, Ok*
Holley, Ron, Woodward, Ok*
Lacefield, Gaylene, Chickasha, Ok
Robinson, Merri, Bartlesville, Ok*
Sheets, Colleen, Moore, Ok*
Smith, Wendell, Allen, Ok*
Tanner, Robert, Bixby, Ok*

Bak, Jacob, Bend, Or*
Benedict, Larry, Monmouth, Or*
Johnson, Karlena, Portland, Or*
Kaup, Debra, Astoria, Or*
Rice-Rosenthal, Yvette, Sherwood, Or*
Wetterlin, Kevin, Damascus, Or*

Abraham, Sherin, Philadelphia, Pa
Acosta, Jorge, Philadelphia, Pa
Anthony, Anastasia, Cochranton, Pa
Bachich, Ron, Hatboro, Pa
Boggi, Nicole, Philadelphia, Pa
Bradeis, Jessica, Morrisville, Pa
Brennan, Lee-Ann, Philadelphia, Pa
Breslin, Rosemarie, Philadelphia, Pa
Brown, Andre, Douglassville, Pa*
Brown, Katiana, Philadelphia, Pa
Brown, Shaneeda, Philadelphia, Pa
Buckner, Jerome, Philadelphia, Pa
Caraballo, Christina, Philadelphia, Pa
Cechvala, Victoria, Drexel Hill, Pa
Chacko, Sunil, Philadelphia, Pa
Cole, Michelle, Philadelphia, Pa
Colon, Kayla, Philadelphia, Pa
Connor, Timothy, Philadelphia, Pa
Croft, Jeffrey, Johnstown, Pa*
Davis, Ronald, Philadelphia, Pa
Dawson, Tracy, Philadelphia, Pa
Delavern, Daniel, Erie, Pa
Diflorio, Lindsay, Philadelphia, Pa
Drummond, Tara, Philadelphia, Pa
Duchner, Michelle, Jenkintown, Pa
Eberly, Janna, Feasterville Trevose, Pa
Fine, Emily, Levittown, Pa
Finn, Michelle, Philadelphia, Pa
Fisher, Kristin, Berwick, Pa
Ginzburg, Lynda, Feasterville Trevose, Pa
Glynn, Erica, Bensalem, Pa
Gonzalez, Evelyn, Philadelphia, Pa
Gries, Journe, Warminster, Pa
Griffith, Zackary, Levittown, Pa
Hanusey, Christine, Philadelphia, Pa
Harrison, Joy, Philadelphia, Pa
Harrison, Julianne, West Grove, Pa*
Hassel, Angela, Bowmansville, Pa
Hegedus, Jessica, Willow Grove, Pa
Hogan, Ashlee, Greenville, Pa
Hosier, Amber, Levittown, Pa
Howard, Be'sheria, Darby, Pa
Hubbard, Joy, Philadelphia, Pa
Huggard, Patrick, Philadelphia, Pa
Ikey, Erika, Levittown, Pa
Impriano, Mercedes, Norwood, Pa
James, Diya, Philadelphia, Pa
Jeffcoat, Myron, Philadelphia, Pa
Johnson, Alayna, Philadelphia, Pa
Johnson, Alshana, Philadelphia, Pa
Johnson, Cameron, Albion, Pa
Jones, Mary, Bensalem, Pa
Jones, Michael, Philadelphia, Pa
Jones, Shmille, Upper Darby, Pa
Joniec, Theresa, Philadelphia, Pa
Karczewski, Nicolas, Jamison, Pa
Kelley, Charles, Philadelphia, Pa
Kelly, Jewell, Philadelphia, Pa
Kubek, Ryan, Philadelphia, Pa
Lachowicz, Shannon, Philadelphia, Pa
Lalanne, Phara, Philadelphia, Pa
Larracuente, Victor, Philadelphia, Pa
Long, Bryanne, Philadelphia, Pa
Marques, Jennifer, Philadelphia, Pa
Martino, Kelly, Bensalem, Pa
McGeehan, Neil, Philadelphia, Pa
McNally, Kristin, Penndel, Pa
McNish, Kadeen, Philadelphia, Pa
Mieciecki, Samantha, Philadelphia, Pa
Moore, Alicia, Philadelphia, Pa
Moore, Jessica, Morrisville, Pa
Moquin, Katie, Harleysville, Pa
Mosa, Vinil, Philadelphia, Pa
Neiderer, Meagan, York, Pa*
Oliver, Sherri, Phila, Pa*
Ortiz, Edna, Philadelphia, Pa
Parlin, Christopher, Philadelphia, Pa*
Petersen, Ashley, Bensalem, Pa
Peterson, Ricky, Philadelphia, Pa
Redling, Rebecca, Doylestown, Pa
Reyes, Justin, Philadelphia, Pa
Reynoso, Cheryl, Philadelphia, Pa
Robinson, Shawn, Philadelphia, Pa
Roedell, Gina, Philadelphia, Pa
Rogers, Jason, Philadelphia, Pa
Russell, Kelly, Cambridge Springs, Pa
Rynkiewicz, Terrilyn, Philadelphia, Pa
Sample, Tanai, Bensalem, Pa
Santiago, Jessica, Philadelphia, Pa
Sarni, Lena, Croydon, Pa
Scannell, Joseph, Philadelphia, Pa
Schickman, Steven, Philadelphia, Pa*
Shaffer, Samantha, Philadelphia, Pa
Shields, Ariana, Philadelphia, Pa
Silver, Leo, Philadelphia, Pa
Smith, Sherae, Philadelphia, Pa
Spadaccino, Danielle, Holland, Pa
Taylor, Tabatha, Bensalem, Pa
Terpilowski, Charles, Erie, Pa
Teti McMillan, Jennifer, West Grove, Pa*
Thomas, Liju, Philadelphia, Pa*
Thomas, Tincy, Philadelphia, Pa
Tomay Ko, Judith, Indiana, Pa*
Turner, Yvonne, East Lansdowne, Pa
Tyler, Hashanna, Philadelphia, Pa
Uphoff, Ashley, Philadelphia, Pa
Vasquez, Alicia, Philadelphia, Pa
Vitali, Cindy, Philadelphia, Pa
Whiteside, Monica, Linesville, Pa
Wright, Jonna, Lancaster, Pa*

Adair, Alysann, Boiling Springs, SC
Baylor, Courtney, Greenwood, SC
Bell, Hilory, Abbeville, SC
Bowers, Erica, Columbia, SC
Bridges, Shanna, Saluda, SC
Callan, Scotty, Bradley, SC
Catoe, Byron, Heath Springs, SC
Chisholm, Michael, Greenwood, SC

Curenton, Francine, Greenwood, SC
Drew, Maurkesha, Greenwood, SC
Fain, Christy, Greenwood, SC
Ford, Jessica, Honea Path, SC
Geddings, Kristi, Abbeville, SC
Gosling, Holly, Ninety Six, SC
Grant Pulley, Shirlene, Cross Hill, SC
Hall, Karen, Silverstreet, SC
Harrison, Lacy, Abbeville, SC
Hawkins, Tracy, Newberry, SC
Jones, Tiffany, Abbeville, SC
Langdale, Diane, Green Pond, SC*
Larimore, Linda, Charleston, SC*
Leatehrwood, Bryan, Murrells Inlet, SC*
Lopez, Karen, Greenville, SC*
McGill, Amber, Donalds, SC
Mitchum, Megan, Abbeville, SC
Pilgrim, Donna, Honea Path, SC
Reynolds, Jim, Laurens, SC
Richey, Michelle, Simpsonville, SC
Templeton, Samantha, Gray Court, SC
Thomas, Nancy, Marion, SC*
Walker, John, Abbeville, SC
Watson, Tennille, Columbia, SC

Aymara, Edwin, Nashville, Tn
Brothers, Rachel, Mount Juliet, Tn
Coleman, Sandrah, Bartlett, Tn*
Curran, Debra, Dyersburg, Tn*
Dorris, Jamie, Nashville, Tn
Glandorf, Sherrie, Spring Hill, Tn*
Heckerman, Traci, Mount Juliet, Tn
Hoyt, Ladona, La Vergne, Tn
Jackson, Suzanne, Goodlettsville, Tn
Johnson, Clare, Collierville, Tn*
Lawson, Brandy, Kingsport, Tn*
Lee, Michael, Murfreesboro, Tn
Martin, Chris, Goodlettsville, Tn
Martin, Richard, Memphis, Tn*
McNab, John, Nashville, Tn
Miller, Laura, Sweetwater, Tn*
Mullinax, Joshua, Carthage, Tn
Nelson, Whitney, Memphis, Tn*
Ownbey, Jason, Nashville, Tn
Pausina, Micah, Murfreesboro, Tn
Pruitt, Kristel, Clarksville, Tn
Saez, Tazlyn, Lebanon, Tn
Shehane, Chase, Portland, Tn

Albrecht, Dennis, Victoria, Tx*
Allen, Jason, Dallas, Tx*
Allison, Lisa, Euless, Tx*
Arwood, Barbara, Coppell, Tx*
Benko, Michael, El Paso, Tx*
Besa, Gabriel, San Antonio, Tx
Brawley, Amanda, Needville, Tx*
Brown, Charlie, Fort Worth, Tx*
Burdeos, Shannon, Missouri City, Tx*
Calvillo, Miguel, San Antonio, Tx*
Cammarata, August, McAllen, Tx*
Chandler, Deanne, Colleyville, Tx*
Collaso, Teresa J, El Paso, Tx*
Collins, Robert, San Antonio, Tx*
Colunga, Victor, Houston, Tx*
Drake, Melissa, San Antonio, Tx
Edgar, Joyce, San Antonio, Tx
Froh, Courtney, Temple, Tx*
Giacometti, Antoine, San Antonio, Tx
Goedereis, Adam, San Antonio, Tx
Henson, Leann, Galveston, Tx
Hocker, Billy, Spring, Tx*
Jackson, Elliot, San Antonio, Tx
Johnson, Derick, San Antonio, Tx
Kayton, Pamela, Dallas, Tx*
Koves, Tena, Huffman, Tx*
Kramer, Kelly, San Antonio, Tx*
Kurian, Jacob, Lewisville, Tx*
Lazek, Heather, Desoto, Tx*
Mariott, Nicholas, Converse, Tx*
Martinez Perez, Carmen, Fort Sam Houston, Tx
Mayfield, Joel, Highland Village, Tx*
Nau, Christopher, Keller, Tx
Przybylski, Brenda, Temple, Tx*
Rasool, Humna, Cypress, Tx*
Rosales, Tammy, Forney, Tx
Stewart, Douglas, San Antonio, Tx
Villarreal, Alfredo, San Antonio, Tx
Ware, Chris, San Antonio, Tx
Werth, Jami, Rockwall, Tx*
Yawn, Grady, Montgomery, Tx*

Colbert, Ebony, Salt Lake City, Ut
Falls, Steven, Salt Lake City, Ut*
Johnston, Korry, Brigham City, Ut*
King, Lori, Taylorsville, Ut*
Murray, Shawna, Taylorsville, Ut*
Rossman, Jami, Stansbury Park, Ut

Albers-Comer, Natalie, Harrisonburg, Va
Andrews, Dan, Glen Allen, Va
Bartell, Eli, Danville, Va
Bell, Joseph, Lanexa, Va
Boddie, Carolyn, Mechanicsville, Va
Brown, Aleathea, Richmond, Va
Burnett, Erika, Hopewell, Va
Chowdhwry, Adnan, Richmond, Va
Cockman, Andrea, Sutherlin, Va
Comer, Julie, Charlottesvle, Va*
Condrey, Valenice, Waynesboro, Va
Crame, Natasha, Newport News, Va
Crone, Kelly, Richmond, Va
Davis, Alyssa, Verona, Va
Durbin, Regina, Richmond, Va
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AARC Members: $50 for 50 words or less; each additional word, $1. Free Internet placement. Nonmembers: $60 for 50 words or less; each additional word, $1.20. Listings are categorized by state. Following the state listings are United States/International, For Sale/For Rent, Miscellaneous, and Situations Wanted. All copy should be typed double-spaced. All ads will be set in 8-point type. To calculate the cost per advertisement, a "word" is considered to be one or more letters, numbers, or special characters with a space before and after.

Ads are featured on the AARC website for one month after publication. Ad may only be placed on the website with an insertion order for placement in an AARC publication. Ad is noncancelable after placement on the website. NOTE: *AARC Times* reserves the right to refuse any advertisement not directly relevant to respiratory care. *AARC Times* does not endorse any advertiser, its positions, practices, services, or products.

We reserve the right to make editorial changes for reasons of clarity and consistency. Every effort is taken to avoid mistakes, but *AARC Times* cannot be responsible for clerical or printing errors. **Deadline for Ad Placement/Cancellation** Deadline for ad placement and written cancellations for the next available issue is January 17. Blind ads available. **For Recruitment Advertising Information, Contact Classified Advertisement** Andrea Conté • Alhambra Plaza • 725 N. Highway A1A, Suite C-106 • Jupiter, FL 33477 • (561) 745-6793 • Fax (561) 745-6795 • AARCAD@aol.com

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For Recruitment Display Ad Rates, go to http://www.aarc.org/marketplace/media_kit/recruitment.pdf, or contact Tim Goldsbury and Associates, Alhambra Plaza, 725 N. Highway A1A, Suite C-106, Jupiter, FL 33477, (561) 745-6793, Fax (561) 745-6795

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Calendar of Events

AARC & State Society Programs

April 17–19
Great Falls, MT
Montana State Respiratory Conference
Contact Bill Carmichael at
williamcarmichael@benefis.org
or (406) 455-5239

July 13–15
Santa Fe, NM
AARC Summer Meetings
Contact AARC, (972) 243-2272,
www.aarc.org/education/meetings

October 21–27
Respiratory Care Week
Contact AARC, (972) 243-2272,
www.aarc.org

October 24
Lung Health Day
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www.aarc.org

November 10–13
New Orleans, LA
AARC International Respiratory Congress
Contact AARC, (972) 243-2272,
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Submissions for the next available issue are due Jan. 17.

For information on submitting calendar events, contact: Beth Binkley, AARC Times 9425 N. MacArthur Blvd, Suite 100, Irving, TX 75063-4706 (972) 243-2272 Fax (972) 484-2720 E-mail binkley@aarc.org

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